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ABSTRACT

This study was conducted to supply information for vocational education planners concerning the employment needs of the health services industry in Colorado. It should also provide some indication of the demand for trained workers in the occupations surveyed by coordinating expected company expansion and replacement needs with the number to be company-trained and with the output of ongoing and/or new vocational training programs. Some general findings from the survey of health institutions were: (1) There is a need for retraining technical workers, and this training should take place annually, (2) Training programs for registered and licensed practical nurses should reflect the expanding roles of occupations, and (3) Physician's assistant, paramedic bio-medical equipment technician, and medication technician were seen as emerging occupations. Tables reflecting current and projected manpower needs by region and analyses of 42 selected health occupations are included in the report. The survey questionnaire and other study materials are appended. (SB)

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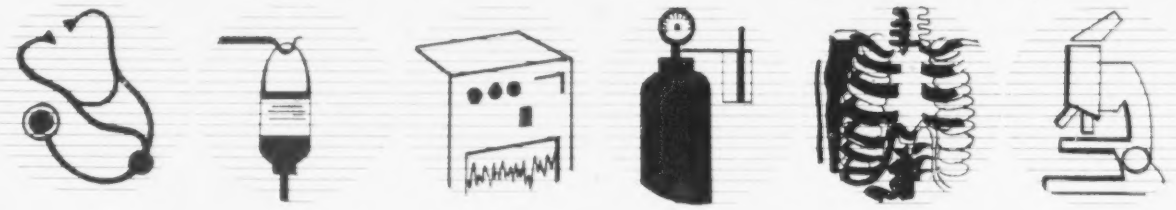
# COLORADO HEALTH OCCUPATIONS MANPOWER SURVEY



## 1972

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STATE BOARD FOR COMMUNITY COLLEGES & OCCUPATIONAL EDUCATION

COLORADO STATE EMPLOYMENT SERVICE

## FOREWORD

The purpose of the report is to provide accurate up-to-date information on existing and expected job openings in Health Occupations for the planning and development of training programs.

The report has been prepared by the State Board for Community Colleges and Occupational Education (SBCCOE) in cooperation with the Research and Analysis Section of the Division of Employment to summarize the results of a comprehensive study of Manpower Needs in the Health Occupations in Colorado.

This study and a previous one in the area of Electronics and Machine Trades represent the beginning of the development of a Comprehensive Job Demand Information system by SBCCOE staff in cooperation with the Division of Employment. When the system is fully operational, information similar to that in this report will be available in all occupational areas for which vocational training programs are offered.

The SBCCOE and Division of Employment wish to take this opportunity to thank all Health agencies, institutions, and personnel who provided information for this project. A special "thank you" is also extended to members of the Advisory Committee for their invaluable input to the study.

Additional copies of this report may be obtained from either:

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Room 207 State Services Building
Denver, Colorado 80203

Colorado Division of Employment
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To all participating employers in the State of Colorado in or related to the Health Field who took the time and effort to complete the survey forms, we extend our grateful thanks and appreciation.

We also wish to thank the following participating organizations who willingly gave information and counsel to make this project possible.

Office of Comprehensive Health Planning

Colorado Associated Nursing Homes, Inc.

Division of Employment

Colorado-Wyoming Regional Medical Program

Department of Institutions

Rocky Mountain Dental Products

Colorado Medical Socitey

Colorado Society of Radiologic Technologists

Colorado Health Careers Council

Colorado Hospital Association

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M.G. Hunt, Assistant Director, Professional Development

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Particular acknowledgment should be made to John E. Conger, who, as Project Coordinator, helped initiate this study and who did much work on it in its beginning.

Kenneth M. Slyziuk
Project Coordinator

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## SUMMARY OF THE STUDY

This study was conducted to supply information for vocational education planners concerning the employment needs of the health services industry in the State of Colorado. It should provide some indication of the demand for trained workers in the occupations surveyed by coordinating expected company expansion and replacement needs with the number to be company-trained and with the output of ongoing and/or new vocational training programs. This project was coordinated by an advisory committee composed of representatives of industries surveyed and from interested governmental agencies. As a result, there was excellent coordination, cooperation, and exchange of information between industry, labor, State Board of Education, State Board for Community Colleges and Occupational Education, and the Colorado Division of Employment.

### Manpower Needs Projected for Each Industry

Tables 1, 2 and 3 are a summary of the data obtained from the mail questionnaires grouped by type of industry. The three largest types of employers of the occupations analyzed in this study are "Hospitals" with an estimated 28,985 employed, "Health and Allied Services Not Elsewhere Classified" with 10,620 employees, (composed primarily of Nursing and extended care facilities), and "Offices of Physicians and Surgeons," with 2,735 employees.

### Manpower Needs Projected By Vocational Planning Region

The State of Colorado is divided into four Vocational Planning

TABLE 1

CURRENT AND FIVE YEAR OUTLOOK FOR SELECTED HEALTH OCCUPATIONS IN THE STATE OF COLORADO

| INDUSTRY | Number Employed in Sample | Estimated Number Employed in State | Estimated Current Vacancies in State | Estimated Total Current Positions | Estimated No. Needed for Expansion by Nov. 1976 | Expected Total Positions by Nov. 1976 | Estimated No. Needed for Replacement by Nov. 1976 | 1/ Expected No. to be Co. Trained by Nov. 1976 |
|---|---|---|---|---|---|---|---|---|
| Medical Electrical Machinery Equip-Sup | 4 | 7 | 0 | 7 | 7 | 14 | 4 | 0 |
| Professional Equipment and Supplies | 43 | 71 | 7 | 78 | 11 | 89 | 10 | 0 |
| Accident and Health Insurance | 0 | 0 | 0 | 0 | 30 | 30 | 0 | 0 |
| Offices of Physicians and Surgeons | 1,663 | 2,735 | 110 | 2,845 | 352 | 3,197 | 418 | 25 |
| Offices of Dentists and Dental Surgeons | 225 | 1,238 | 77 | 1,315 | 94 | 1,409 | 633 | 11 |
| Offices of Osteopathic Physicians | 10 | 16 | 1 | 17 | 16 | 33 | 0 | 0 |
| Offices of Chiropractors | 2 | 3 | 0 | 3 | 0 | 3 | 0 | 0 |
| Hospitals | 17,628 | 28,985 | 1,575 | 30,560 | 4,757 | 35,317 | 15,255 | 5,615 |
| Medical and Dental Laboratories | 137 | 225 | 11 | 236 | 120 | 356 | 48 | 18 |
| Health and Allied Services, N.E.C. | 6,459 | 10,620 | 1,023 | 11,643 | 812 | 12,455 | 4,517 | 1,010 |
| Elementary and Secondary Schools | 95 | 156 | 4 | 160 | 13 | 173 | 19 | 7 |
| Colleges, Univ. Prof. Schls. and Jr. Col. | 9 | 15 | 0 | 15 | 0 | 15 | 0 | 0 |
| Correspondence and Vocational Schools | 19 | 31 | 18 | 49 | 37 | 86 | 37 | 97 |
| Schools and Educational Services, N.E.C. | 31 | 50 | 1 | 51 | 67 | 118 | 30 | 0 |
| Professional Membership Organizations | 45 | 74 | | | | | | 0 |
| Public Health Departments | 425 | 698 | 71 | 769 | 278 | 1,047 | 235 | 19 |

1/ Detail may not add to total due to rounding

TABLE 2

ESTIMATED OUTLOOK BY INDUSTRY AND BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976
FOR EXPANSION AND REPLACEMENT IN THE STATE OF COLORADO

| INDUSTRY | Estimated Number Needed for Expansion by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | Total Expansion in 5 years | Estimated Number Needed for Replacement by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | 1/ Total Replacement in 5 years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Electrical Machinery Equip-Sup. | 1 | 0 | 3 | 0 | 1 | 7 | 1 | 0 | 1 | 0 | 1 | 4 |
| Professional Equipment and Supplies | 3 | 7 | 0 | 0 | 1 | 11 | 3 | 3 | 0 | 1 | 1 | 10 |
| Accident and Health Insurance | 7 | 13 | 10 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| Offices of Physicians and Surgeons | 60 | 115 | 82 | 11 | 82 | 352 | 110 | 92 | 69 | 49 | 97 | 418 |
| Offices of Dentists and Dental Surgeons | 17 | 55 | 6 | 6 | 11 | 94 | 341 | 105 | 39 | 77 | 66 | 633 |
| Offices of Osteopathic Physicians | 3 | 3 | 4 | 4 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 |
| Offices of Chiropractors | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hospitals | 857 | 973 | 896 | 1,034 | 996 | 4,757 | 3,741 | 2,965 | 2,528 | 2,938 | 3,085 | 15,255 |
| Medical and Dental Laboratories | 28 | 26 | 15 | 21 | 30 | 120 | 10 | 7 | 8 | 15 | 8 | 48 |
| Health and Allied Services, N.E.C. | 344 | 161 | 69 | 56 | 181 | 812 | 1,210 | 940 | 721 | 806 | 840 | 4,517 |
| Elementary and Secondary Schools | 7 | 1 | 3 | 1 | 0 | 13 | 1 | 4 | 3 | 4 | 3 | 19 |
| Colleges, Univ. Prof. Schls. and Jr. Col. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Correspondence and Vocational Schools | 1 | 3 | 3 | 13 | 16 | 37 | 3 | 3 | 3 | 15 | 13 | 37 |
| Schools and Educational Services, N.E.C. | 31 | 16 | 16 | 1 | 1 | 67 | 0 | 0 | 0 | 15 | 15 | 30 |
| Professional Membership Organizations | 16 | 18 | 0 | 15 | 16 | 67 | 16 | 13 | 0 | 15 | 16 | 60 |
| Public Health Departments | 44 | 82 | 41 | 56 | 51 | 278 | 31 | 56 | 58 | 41 | 49 | 235 |

1/ Detail may not add to total due to rounding

TABLE 3

ESTIMATED CURRENT VACANCIES BY EXPANSION AND REPLACEMENT NEEDS AND THE ESTIMATED NUMBER TO BE COMPANY TRAINED BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976, IN EACH INDUSTRY IN THE STATE OF COLORADO

| INDUSTRY | Estimated Number of Vacancies by November 1976 | | | Estimated Number to be Company Trained by Year (Nov. 1972 thru Nov. 1976) | | | | | 1/ Total Number Expected to be Company Trained by November 1976 |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Expansion | Replacement | 1972 | 1973 | 1974 | 1975 | 1976 | |
| Medical Electrical Machinery Equip-Sup. | 11 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Professional Equipment and Supplies | 21 | 11 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Accident and Health Insurance | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Offices of Physicians and Surgeons | 769 | 352 | 418 | 4 | 10 | 4 | 3 | 0 | 25 |
| Offices of Dentists and Dental Surgeons | 726 | 94 | 633 | 6 | 0 | 0 | 0 | 6 | 11 |
| Offices of Osteopathic Physicians | 16 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Offices of Chiropractors | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hospitals | 20,013 | 4,757 | 15,255 | 1,399 | 1,105 | 931 | 1,095 | 1,085 | 5,615 |
| Medical and Dental Laboratories | 167 | 120 | 48 | 1 | 1 | 0 | 7 | 8 | 18 |
| Health and Allied Services, N.E.C. | 5,329 | 812 | 4,517 | 289 | 174 | 125 | 197 | 233 | 1,010 |
| Elementary and Secondary Schools | 32 | 13 | 19 | 1 | 1 | 0 | 1 | 1 | 7 |
| Colleges, Univ. Prof. Schols. and Jr. Col. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Correspondence and Vocational Schools | 75 | 37 | 37 | 7 | 16 | 21 | 26 | 26 | 97 |
| Schools and Educational Services, N.E.C. | 97 | 67 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| Professional Membership Organizations | 130 | 67 | 60 | 0 | 0 | 0 | 0 | 0 | 0 |
| Public Health Departments | 513 | 278 | 235 | 11 | 3 | 4 | 0 | 0 | 19 |

1/ Detail may not add to total due to rounding

Regions. The planning regions are used by various state agencies for regional analysis and planning. The counties that compose these regions are presented in the Map, "Planning Regions."

The following information is an analysis of the manpower requirements for each planning region. The occupations cited have been specifically idenitified for their very evident need in the regions. A close analysis of these summaries and the related tables is necessary to obtain a complete picture of the overall manpower requirements of the Health Occupations in Colorado.

## Region I - Central

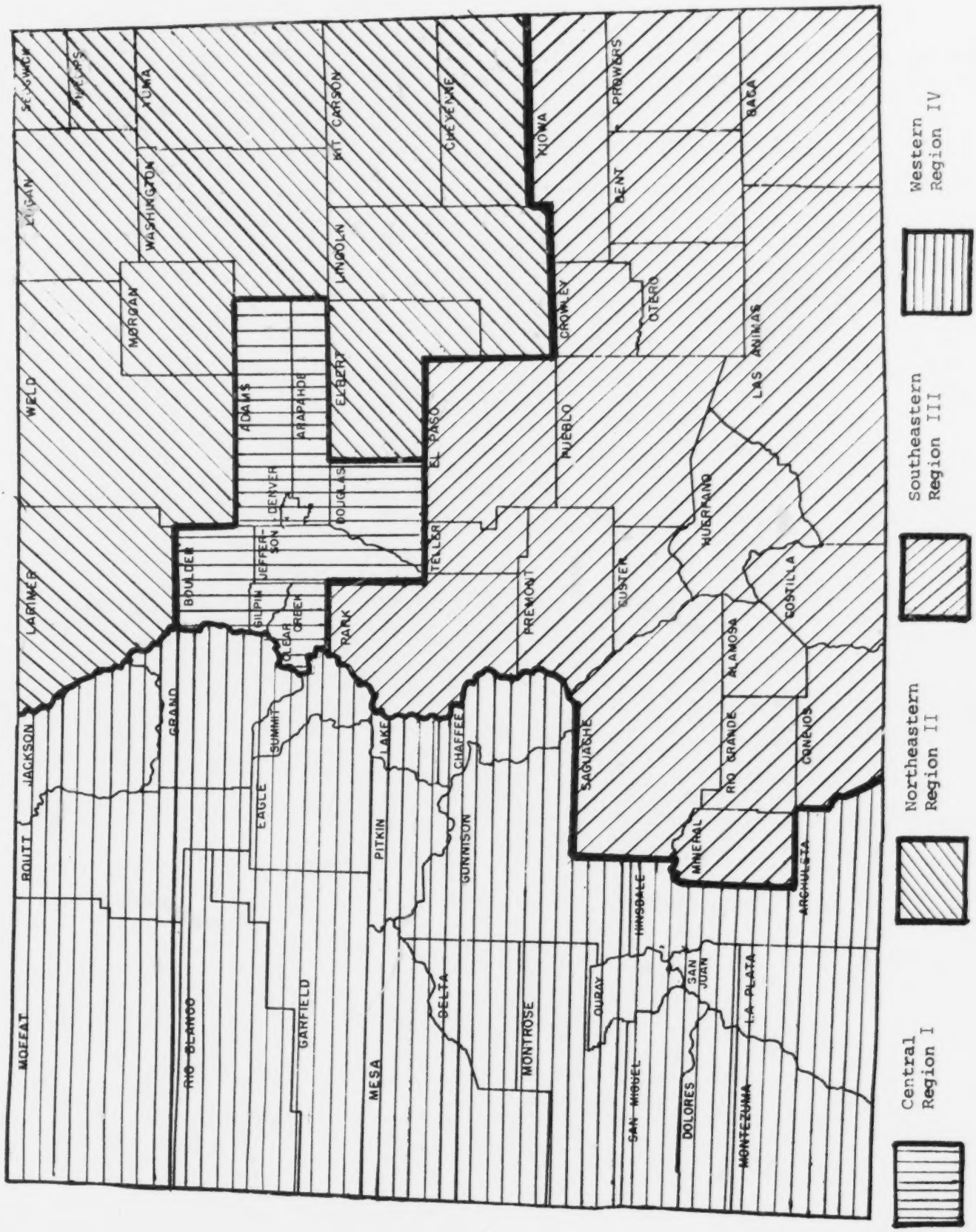
The Central Vocational Planning Region is comprised of the Denver Metropolitan area. It has the largest number of health workers of any region. The needs of this urban area differ from the rural planning regions in the type of training to be presented and personnel to be trained.

Most of the demand for technicians such as in Bio-Medical occupations, Dental Laboratories, etc., are located in Region I.

The data indicated that a smaller proportion of workers are company-trained in the Central Region compared to those company trained in the other Vocational Planning Regions. This generalization can be made for all occupations analyzed in this study for Region I.

In Region I, employers emphasized the fact that they had a great amount of difficulty in filling the positions of Registered Nurses, Licensed Practical Nurses, Medical Secretaries, Dietary Aides and Nurses Aides.

STATE BOARD FOR COMMUNITY COLLEGES AND OCCUPATIONAL EDUCATION
PLANNING REGIONS



The fact that the manpower needs are large and centralized lends itself readily to the establishment of training programs.

The information presented for the Central Region is in Tables 6, 11 and 16 (pages 44, 49 and 54).

Region II - Northeastern

For Region II, one of the three rural regions, Registered Nurses and Licensed Practical Nurses will be in great demand for both replacement and expansion needs over the next five years. No employing institututions plan to have any training programs to prepare persons for employment in these two occupations. The estimated need for Nurse Aides, to meet both the expansion and replacement requirements up to November 1976, is high. An expected 1,484 persons will be needed for this period, with only 311 to be company trained. There is an unquestionable need to supply trained Nurse Aides in this region. A total of 33 Medical Record Clerks are needed to meet the estimated expansion and replacement requirements up to November 1976, only one is estimated to be trained by an employing institution.

Housekeepers, Dietary Aides and Orderlies all present moderate manpower needs for this region throughout the five-year period. A close scrutiny of these occupations is necessary to determine the numbers to be trained each year.

For back-up and additional information for the Northeastern Planning Region, see Tables 7, 12, and 17, (pages 45, 50 and 55).

Region III - Southeastern

The professions of Registered Nurse and Licensed Practical Nurse show a very evident replacement and expansion need in the Southeastern Region.

Nurse Aide, Dietary Aide, and Inhalation Therapist have a high manpower requirement over the five-year study period. These observations are based on those expected to be needed for expansion and replacement in relation to those estimated to be company trained.

Food Service Supervisor, Housekeeper, and Psychiatric Technician have a relatively high manpower need, while the occupations of Medical Records Clerk, Orderlies and Ward Clerks have a moderate need for the establishment of training programs over the five-year study period.

All occupations are grouped into categories of manpower needed for Planning Region III. (See Table 14, page 52)

Region IV - Western

This vocational planning region is the smallest in the total number of health employees studied. Numbers, by no means, reflect the degree of importance in meeting these needs.

There is a large need for the establishment of R.N. training programs to meet their estimated manpower requirements. The profession of Housekeeper has a relatively high need, while Licensed Practical Nurses, Dietary Aides and Medical Office Assistants show a moderate need for new programs and/or expansion of exisiting programs.

This planning region appears to be the most self-sufficient in regard to meeting their own manpower needs through company training programs. However, as in the other regions, many institutions providing "clinical" experience for Community College training programs were prone to report these as "their" (institution) training programs, giving a somewhat inflated estimate of the number to be company trained.

## SUMMARY OF STATE NEEDS

The health institutions interviewed, both within the Denver Metropolitan area and outside it, all emphasized the need for retraining technical workers. Specific technical occupations were not mentioned individually, but rather, the entire category, which, in this study, includes Dental Laboratory Technician, E.C.G. Technician, E.E.G. Technician, Histological Technician, Medical Emergency Technician, Medical Laboratory Technician, Medical Records Technician, Mental Retardation Technician, Nuclear Medicine Technician, Optic Technician, Psychiatric Technician, Radiation Therapy Technician, Radiologic Technician, and Surgical Technician. The majority of those interviewed throughout the state felt that retraining should take place on an annual basis, and the next largest group felt every two years.

It should be mentioned once again that the occupations given the title of Professional Nurse R.N. and Technical Nurse R.N. should be combined under one profession "Registered Nurse." This was determined after it became apparent that most respondents who employed Registered Nurses did not distinguish between the two, but generally just put their R.N.s in the Professional Nurses category.

A very significant factor to be considered closely is the expanding roles of these occupations. Roles are defined as "duties, responsibilities, and functions of that position." As the role of the Registered Nurse is expanding, there appears to be a corresponding role expansion in the occupations of Licensed Practical Nurse and Nurse Aide. This is particularly important in considering the training that new personnel should receive for each of these occupations. The roles of the three occupations have changed and the training programs for new people to

fill these positions should adjust accordingly. Data collected also indicates a critical need for increased emphasis on retraining and upgrading programs to serve Registered Nurse, Licensed Practical Nurses and Nurse Aides presently employed.

Doctor's Assistant, Paramedic Bio-Medical Equipment Technician and Medication Technician were new occupations foreseen by those institutional representatives interviewed. They are presently listed in the order most frequently cited. The occupation of Doctor's Assistant was mentioned by approximately 80% of all those interviewed. With the exception of the occupation of Bio-Medical Equipment Technician, these other new occupations fill the similar and significant role of relieving the health professional such as Medical Doctor and Registered Nurse of some of their more routine tasks. This is an important area of definite need and should be analyzed carefully by those establishing health manpower training programs.

Throughout the report, recommendations to establish training programs are by occupational area. These recommendations were based solely on the statistical and personal information gathered in the data collection phase of this study. There was no knowledge of what was ongoing in the training area of these occupations. This information must be considered in conjunction with the recommendations that are listed.

## Rural vs Big City Needs

In some of the more rural, less populated areas of Colorado, there is a critical shortage of certain medical personnel in some of the occupations analyzed in this study. For both economic and social reasons, the only solution appears to lie in the recruitment and

training of local people to meet these needs. This can be initiated most readily by the State Board for Community Colleges and Occupational Education. For the health institutions to provide efficient and adequate care to their patients, they must be adequately staffed by both the quality and quantity of personnel needed to do so.

In attempting to fill the health manpower needs of a particular health insititution within the State, a listing of various types of public and private training schools from the State Board for Community Colleges and Occupational Education should be used from which to draw. Institutions in the rural areas should also maintain close contact with the Job Development Specialists in Community Colleges in their area. Various occupations that have licensure boards and associations provide program lists of this type by location to show the manpower resources located in particular communities.

General Comments From Those Interviewed

The health institutions interviewed made very positive comments about the training of these occupations. The majority felt that the retraining of all of the occupations in the study should take place. The time period was as follows: 40% felt it should be done annually, 20% every two years or more, 23% stated continuously, with no time mentioned, 7% monthly, and 1% every six months.

Of those interviewed, the position of Doctor's Assistant was ranked first as a new or emerging health occupation. This position was described as one which would relieve the doctor of many of his routine duties. Registered Nurses with special training, and Armed Forces Medics with additional training, were both mentioned to fill this position. The occupation of Medical Computer Programmer was mentioned as second in this category.

The response to the question "What health occupation should vocational education planners be aware of to develop training programs?" was based on anticipated health institutions needs. The health institutions outside the Denver area responded that they should be more aware of the rural area and their needs. More Registered Nurses and Practical Nurses are needed for the rural areas. They felt strongly that there was a need to inform people of the great needs in all of the allied health occupations.

The Denver area health institutions responded to this same question by the following: Make students aware of jobs in the health field. Medical terminology should be stressed in all training. Training programs are needed in areas of technicians, Medical Assistants, Dental Hygienists, Maintenance and Dieticians.

EMPLOYER REFERRAL PREFERENCE RATING

Employers prefer to stay within their own institutions when attempting to fill vacancies in their firms. The category "from other sources" which is primarily newspaper advertising was listed second as a source in filling vacancies in their institutions. Referrals from the institution's own health workers for new employees was the third largest source.

Outside industry sources of manpower to fill vacancies within firms in the health industry were ranked in employer preference, most to least as follows:

From other institutions
From the State Employment Division
From Private Employment Agencies
From Vocational Schools
From the Particular Health Occupational Organization

TABLE 4

EMPLOYER REFERRAL PREFERENCE RATING PERCENTAGES IN THE STATE OF COLORADO

| CHOICE | FROM WITHIN YOUR INSTITUTION | FROM OTHER INSTITUTIONS | REFERRALS FROM YOUR INSTITUTIONS HEALTH WORKERS | FROM VOCATIONAL SCHOOLS | FROM THE STATE EMPLOYMENT DIVISION | FROM PRIVATE EMPLOYMENT AGENCIES | FROM THE PARTICULAR HEALTH OCCUPATIONAL ORGANIZATION | FROM OTHER SOURCES | TOTALS |
|---|---|---|---|---|---|---|---|---|---|
| FIRST | 32% | 10% | 12% | 6% | 9% | 8% | 6% | 18% | 100% |
| SECOND | 7% | 16% | 18% | 15% | 15% | 9% | 6% | 14% | 100% |
| THIRD | 10% | 17% | 12% | 17% | 12% | 10% | 12% | 11% | 100% |
| RANK PREFERENCE | 1 | 4 | 3 | 6 | 5 | 6 | 2 | | |

## ANALYSIS OF SELECTED OCCUPATIONS

### Activities Director

The estimated number of Activities Directors needed for expansion and replacement will be minimal within the next five years. This small demand would best be met by either employing those with an applicable background for this position or by institutional training where the need is apparent.

### Bio Medical Equipment Technician

There is presently an estimated 99 current positions of Bio Medical Equipment Technicians within the State. By 1976 there will be an estimated need of nearly twice that number. To meet this need, employing health institutions plan on training nearly all the necessary personnel to meet these manpower requirements. The importance placed on this position is reflected by the response of the health institutions outside the Denver Metropolitan area who were interviewed. The listed this position third among the professions they felt would show the greatest personnel need within five years.

### Cytotechnician

This is a stable occupation with little expansion or replacement needs estimated for the next five years. The small number that will be needed could conceivably be provided from the outside sources. Therefore, the future expected needs are not great enough to warrant the establishment of training programs.

### Dental Assistant

There are currently an estimated 66 vacancies within the State for

Dental Assistants. The present dental field will be expanding modestly within the next five years. By the end of this period, an estimated 96 new Dental Assistants will be required to meet the expansion needs. The replacement needs for this same period are quite high, reflecting a large turnover in this occupation. Five hundred sixty-four is the estimated replacement necessary through November 1976. The estimated number of Dental Assistants to be company-trained is quite small and does little in meeting these manpower requirements. There is a great need for programs that will annually turn out a minimum of 75 trained Dental Assistants. These programs should be an integral part of a Dental Occupations Cluster program offered through the community colleges.

## Dental Hygienist

The occupational picture for this position is similar to that of the Dental Assistant. The only difference is that the Hygienist occupation has a smaller proportionate turnover rate, indicating that it is a more stable occupation that the Dental Assistant. No Dental Hygienists are expected to be trained by the employing institutions. Some may come from the Dental Assistant occupation. This indicates a great need for up-grading and in-service adult programs tied closely to the above-mentioned Dental Occupation Cluster program.

## Dental Laboratory Technician

The occupation of the Dental Laboratory Technician is characterized by its stability. It is estimated that it will incur a relatively moderate expansion over the projected five year period (92 positions). The replacement number (33) is small, which signifies little turnover in the past

and small expectation of turnover in the future. Eighteen Dental Laboratory Technicians are expected to be company-trained within the next five years, far short of those that will be needed to meet industry needs.

## Dietary Aide

Of the occupations studied, Dietary Aide ranks fourth in number of employees. They are employed on a part-time basis extensively within the State.

Health institutions throughout the State have expressed a difficulty in filling this position. The reasons given by the institutional representatives interviewed were: low pay, low job status and the inadequate training pertaining to their related duties. Two solutions were expressed by most of those interviewed -- raise the pay and train local people. Both of these ideas would seem to ease the difficulty in filling the Dietary Aide occupation.

The health institutions interviewed within the Denver Metropolitan area expressed the high number of necessary replacements, reflecting a large turnover rate in this geographic location for Dietary Aides. It appears that training programs for this position should be an integral segment of a Food Supervisor training program.

## E.C.G. Technician

Of the 333 estimated total current positions, 46 more will be needed for expansion and 122 for replacement by November 1976. An expected total of 33 E.C.G. Technicians will be trained through employing institutions by November 1976; this number is considerably short of the E.C.G. Technicians actually needed by this period. Therefore, outside training sources will

be necessary to meet the demand. Compiling the results of the health institutions interviewed outside the Denver Metropolitan area, this occupation was ranked third as most critical to the operation of their organization. It appears that one good training program, probably in the Metro area, could meet this need.

## E.E.G. Technician

The Electroencephalograph Technician occupation has an estimated 75 positions in the State. This technician occupation differs from the E.C.G. Technician, in that it operates equipment that measures impulse frequencies and differences in electrical potential between various areas of the brain while the E.C.G. Technician operates equipment that records action of the heart used in the diagnosis of heart ailments.

There will be an estimated 33 additional E.E.G. Technicians needed for expansion by November 1976, raising the expected total positions to 108 by November 1976. The number needed for replacement by the end of the five years is 49, an increase of almost 66% of the present estimated total current positions. Only 15 of these 49 E.E.G. Technicians will be trained by employing institutions. Again, no more than one such community college program in the state can be justified.

## Food Service Supervisor

This occupation has a steady increase in the numbers annually required for both expansion and replacement requirements. From the health institutions interview outside the Denver Metropolitan area, it was concluded that this occupation along with another were jointly listed as the professions in greatest need of establishing training programs.

The expected number of Food Service Supervisors to be company-trained within the five year study period is just a small portion of the 147 needed. Vocational educational planners should view this profession carefully for the establishment of training programs.

## Histological Technician

This profession is a stable one, much like that of the Food Service Supervisor. In considering the estimated number of total positions, it is a small occupation. The estimated number needed for expansion is approximately five new Histological Technicians per year until 1976. A total of 69 will be needed to meet the estimated replacement requirements through 1976.

It is evident that industry training programs will meet the number of Histological Technicians needed for the next five years.

## Home Health Aide

Home Health Aide is one of the smaller employing occupations. There are only 54 estimated current positions in this occupation. Although the estimated expansion rate is approximately 17 percent per year, the actual number involved is very small. The estimated number of Home Health Aides to meet the replacement need is also quite small.

Occupational education planners will still need to view this occupation in consideration for training programs. The need is there even though the total numbers are small.

## Housekeeper

There is presently a strong demand for this occupation, and indications show it will increase. There is an estimated 2,036 total current

positions with 260 needed for expansion and 598 for replacement throughout the period to November 1976. Only 137 are estimated to be company-trained over this same time period.

The data that were compiled from the personal interviews showed that in health institutions outside the Denver area, the Housekeeper occupation was listed as the fourth most difficult position to fill, and attributed the reason to low pay. From this same geographic area, it was computed that Housekeeper was ranked second in need to establish a training program in this position. The need to produce a better qualified and trained person for this occupation was cited. Serious consideration must be given to training these persons through existing Insitutional Housekeeping programs with a strong cooperative component in Health Institutions.

Inhalation Therapist

The estimated number of Inhalation Therapists needed for expansion by November 1976 is estimated at only 64; averaging less than 13 per year. Yet, data supplied by health institutions outside the Denver Metropolitan area showed that this profession was third in what these institutions felt was going to be an emerging occupation in the health field. This apparent contradiction is explained by the fact that, though they believed it to be an emerging occupation, they were not sure exactly when, or how many persons would be needed.

Occupational education planners will need to watch the demand for this profession closely, especially in the more rural areas. It was also brought out that health institutions throughout the State were well satisfied with the training the Inhalation Therapists brought with them from existing community college programs.

## Medical Computer Programmer

This occupation is characterized by the increase in the numbers needed each year till late 1976. By November 1976 there will be an estimated 36 new Medical Computer Programmers needed for expansion. Health institutions can relate readily to the type of services an automated, computerized, information gathering system can provide. As more health institutions begin utilizing these systems, the demand for this occupation will increase.

From all the health institution representatives interviewed throughout the State, Medical Computer Programmer was listed first by those in the Denver Metro area and second by those outside it, as a new or emerging health occupation that will be developing. Findings show that 36 new Medical Computer Programmers will be needed by 1976, plus 10 more were estimated to be needed for replacement, and yet only three are expected to be company-trained within the next five years. This fact, coupled with the information gathered in the interviewing process, should warrant a careful analysis of this occupation by vocational planners.

These job needs should be met through existing Computer Programmer programs, if program supervisors and teachers are will to add components required by this occupation.

## Medical Emergency Technician

This is another occupation that presents a very strong need for training programs. With an estimated present total of 99 current positions, there will be -- by November 1976 -- 84 estimated new positions bringing the total to 183. Additionally, an estimated 60 will be needed for replacement by November 1976. It has also been estimated that only three are expected to be institutionally trained over this same period. These factors

viewed together present a strong need for an annual output of trained Medical Emergency Technicians.

Although there is a need to develop training programs for this occupation, it should be offered in no more than two locations.

Medical Insurance Clerk

The health institutions interviewed in the Denver Metro area commented very positively on this profession. It was their feeling that with the new health insurance programs and the greater utilization of them that there will be a very marked increase in demand for these Medical Insurance Clerks.

Of the Medical Insurance Clerks presently working, it was felt that additional training was necessary for them to perform their tasks more efficiently. It was also ranked first by these health institutions in the need for retraining to adjust to the changing health care system. It was ranked third in what was going to be the greatest need in the occupations studied within five years. They also stated explicitly that there was a definite need to establish programs for the training of new personnel immediately for this occupation.

Little mention was made by the health institutions interviewed outside the Denver Metropolitan area about this occupation.

One hundred and seven is the estimated number needed for expansion, 220 estimated for replacement and only 18 will be trained by the employing institutions. These estimates which are for the five year analysis period, strongly show the need for additional Medical Insurance Clerks. These employment needs should be met through existing Business and Office programs if special segments in Medical Insurance and cooperative components are added.

## Medical Laboratory Technician

This occupation has a strong continuing need throughout the five year analysis period, for both expansion and replacement requirements. A total of 248 Medical Laboratory Technicians are estimated for expansion by November 1976, distributed evenly throughout the five years. Four hundred thirty-nine are estimated to be the replacement needs for this same period. From the data collected, it appears that the employing institutions will be training close to the estimated number of Laboratory Technicians they will need. Four hundred thirty-seven are expected to be company-trained ove. the next five years.

The Medical Laboratory Technician occupation was cited by the health institutions interviewed throughout the State as being within the top five occupations that they considered most critical to the operation of their organization. It was ranked fourth within all the occupations studied by the health institutions outside the Denver Metropolitan area as the most difficult occupation to fill. The reasons that were given for this were the geographic location of the institutions, low pay, and the statewide demand for this profession, hence its inherent mobility.

Institutions within the Denver Metrpolitan area do employ Laboratory Technicians extensively on a part-time basis.

## Medical Laboratory Assistant

This occupation shows a moderate growth throughout the next five years. Seventy-two new Medical Laboratory Assistants are estimated to be needed by November 1976 for expansion, with the greatest need in the second and fifth years. One hundred seventy-one is the estimated replacement number through November 1976. Only 16 are expected to be company-trained for this period.

## Medical Librarian

There are an estimated 142 current positions in this occupation. It will be expanding to an expected 161 by November 1976. Thirty are expected needs for replacement over the same period. Only four are estimated to be trained by the employing institutions.

## Medical Office Assistant

There are an estimated 40 current vacancies in the State; 149 more is the expected expansion requirements by November 1976.

The health institutions interviewed in the Denver area ranked Medical Office Assistant second in having difficulty in filling the position. The reason mentioned most was the problem in finding an adequately trained person to perform the required tasks.

The occupation of Medical Office Assistant was listed by the interviewed health institutions as being one of those least critical to their operation. Another significant point was the need to train these medical Office Assistants in medical terminology, an area that needs emphasizing by vocational planners.

## Medical Records Clerk

There are presently an estimated 36 current vacancies in the State for Medical Records Clerks. Eighty-four more are expected to be needed for expansion purposes and 207 for replacement until November 1976.

This position was cited by the interviewed health institutions outside the Denver area as difficult to fill. The most common reason cited was the lack of adequately trained Records Clerks in their areas. All the health institutions interviewed within the State expressed the need to establish

training programs for this occupation.

Eighty-one Medical Records Clerks are expected to be trained by the employing institutions through November 1976. Yet, the institutions expressly stated that an outside agency should do the training for this profession, perhaps reflecting the desire for more uniformity and comprehensiveness than what they can achieve.

To meet the personnel needs for this occupation and those of Medical Records Technician, it appears that a program at the community college level should be developed. Such a program must be a combination program developed through cooperative efforts of Health Occupations and Business and Office staff members. It appears that such programs should be offered in no more that three locations in the state.

## Medical Records Technician

There are an estimated ten current vacancies in the State. Forty-nine is the estimated number needed for expansion, and 85 is estimated for replacement, both by November 1976. Thirty-three are expected to be company-trained within this same time period.

The Medical Records Technician was stated as being difficult to fill like that of the Medical Records Clerk. The ten current vacancies are evidence of this. The individuals interviewed throughout the State also stated that training programs should be started in this occupation. With this positive statement made about these two occupations, the establishment of a training program is a necessity.

## Medical Stenographer

The information obtained from the mail questionnaires reveals nothing

unusual or problematic about this occupation. Six hundred thirty-one estimated total current positions, 70 estimated for expansion and 163 estimated for replacement by November 1976 and 33 to be company-trained over this same period.

However, in reviewing the information derived from the personal interviews, this occupation would have to be listed in the top five for total comments.

Representatives of health institutions from the Denver Metropolitan area listed Medical Stenographer as the second most difficult position to fill. The explanation for this was the lack of well-trained personnel. These same representatives listed Medical Stenographers fourth in occupations that needed retraining to adjust to the changing health care system.

The representatives of health institutions interviewed outside the Denver area were even more dissatisfied with this occupation. They listed it first in the need for additional training to perform their tasks more efficiently. It was listed second in the need for new training.

The primary cause for this dissatisfaction is attributed to medical terminology. It was felt that these Medical Stenographers could not perform their tasks adequately due to a lack of understanding in this field. Concrete statements made by those interviewed such as "Medical terminology should be stressed to a much greater degree by vocational planners," and "Training programs should be set up for retraining medical personnel in medical terminology," strongly indicate the need in this area.

It can be deducted from this that medical terminology should be emphasized more in the training of Medical Stenographers. Also, courses on medical terminology should be provided for retraining of Medical Stenographers and also many of the other occupations studied.

## Mental Health Worker

The health institutions outside the Denver area responded to the question of what was going to be the greatest need in the health occupations within five years, by listing Mental Health Worker as fourth.

There are 16 estimated present vacancies for Mental Health Workers. By November 1976, 63 more will be needed through expansion. There will be an estimated replacement of 41 within the next five years, and only three will be institutionally trained.

The needs for this occupation for the next five years merit careful analysis by the vocational education planners. It appears there may be a need for training programs in two locations in the state.

## Mental Retardation Technician

The occupation of Mental Retardation Technician is most significantly characterized by the estimated number for replacement; 271 by November 1976. Only 11 will be needed for expansion over this same time period. A total of 354 positions is the expected figure by November 1976.

This occupation has a high turnover, low expansion needs, and the institutions themselves appear to be meeting their own needs for this profession.

## Nuclear Medicine Technician

The personnel needs for Nuclear Medicine Technician are immediate. There are an estimated 10 current vacancies, out of 91 present total positions in the State, a vacancy rate of 10 percent.

Thirty more are estimated to fill the expansion needs through November 1976, and 60 will be needed to meet the expected replacement needs over the

same period. With only 19 expected to be trained by the employing institutions, the need to establish a training program for more Nuclear Medicine Technicians is clear. The estimated need of Nuclear Medicine Technicians should be appraised by year for the period till November 1976. It appears that they should be spaced out every other year rather than each year.

Nurse Aide

This occupation has the largest number of employees of all the occupations studied. There are an estimated 11,464 employed in the State, 878 estimated current vacancies, for a total of 12,343 positions. The replacement rate is approximately 10% per year, with 1,214 needed for expansion through November 1976. A total of 2,094 is the expected number to be trained by employing institutions for the same period.

A large quantity of information was obtained through the interviewing process about the Nurse Aide occupation.

They are employed extensively throughout the State on a part-time basis. They were ranked third by both geographic groups in this category. The Denver area health institutions had difficulty in filling the Nurse Aide position and ranked it third. It was ranked seventh in this category by those health institutions outside the Metro Denver area. The reasons given by the Denver area institutions were the lack of well-trained Nurse Aides, and the other health institutions attributed it to their geographical location.

Nurse Aides were listed by those interviewed in the Denver area as the second least critical occupation to their operation and had an annual turnover of 30%. Those health institutions outside the Denver area listed it as third as the least critical occupation to their operation

and recorded a 31% annual turnover rate. The reason for this high turnover rate, compiled by the institutions interviewed in the Denver area was said to be the low wage, low status, and the relatively young and mobile groups which most commonly filled this position. They mentioned only one solution; raising their respective salaries. The institutions outside the Denver area listed the same reasons for the high turnover as the Denver area institutions while there solution was to train more local people and to select from a more mature labor force in employing Nurse Aides.

All the institutions interviewed felt that additional training was needed to perform their tasks more efficiently. Nurse Aides were first in this category by both geographic groups. The response to the question of which sub-professional occupations they felt retraining should take place to adjust to the changing health care systems. Nurse Aide was listed as second by those outside the Denver area and first by those inside the Denver Metropolitan area. Both groups interviewed felt that there was a definite need to establish training programs for Nurse Aides.

Therefore, the Nurse Aide occupation can be characterized by a high turnover attributed to its low pay and low status. Generally it was felt the job should be elevated both in terms of duties and higer pay. Thus, training programs should be set up to retrain those presently in the position and to train new Nurse Aides. This would reduce the turnover through a higher job status and greater payment for hours worked.

## Occupational Therapy Aide

There is an estimated 13 current vacancies in the State. Fifty-two

is the estimated number needed for expansion by November 1976. Only 16 are expected to be company-trained by the end of this same period, and 48 is the estimated number for replacement by November 1976.

Occupational planners will have to view this occupation in greater depth to determine how many will be needed each year. The overall need is clearly evident.

It appears that two good programs could meet this occupational need. These programs should be located outside the Metro area to meet needs in rural areas.

## Optic Mechanic

This position, Optic Mechanic, shows no indication for the establishing of training programs, due to the extremely small numbers involved. Three are estimated for expansion and four are estimated for replacement by November 1976.

## Optic Technician

No action by vocational planners is warranted by this position. Also, there are no recorded vacancies, none for expansion and none for replacement through November 1976.

## Orderly

In the Denver area, the health institutions interviewed experienced a high turnover in this occupation. They attributed this to several factors; the low wage, boredom with job, lack of training and no promotional opportunities. To curb this high turnover, several steps were mentioned: More in-service training, increased salary, the development of a career ladder for promotions, and to create more personal fulfillment within the job.

Orderlies were ranked third by the persons interviewed in the need for additional training, and second for the need to retrain those in this occupation. It was also mentioned as one of the several occupations that were listed as being least critical to the operation of the organization.

The health institutions interviewed outside the Denver area, also have difficulty in filling this position, and through combining all responses, it was ranked sixth in this area. The reasons given for this were geographical location of the institutions, and the low pay. Some said they primarily filled this position with students, and because of their inherent mobility had a high turnover. Poor hours, low pay and job dissatisfaction were other reasons given for the high turnover. To help solve this turnover problem, factors such as increased pay, better hours, and the creation of opportunity for advancement were mentioned.

The occupation of Orderly was ranked second by those interviewed for the need of additional training.

Each of the above factors should be studied carefully in the establishment of training programs. The need for this occupation is clear. There are 167 estimated current vacancies in the State for orderlies. Four hundred and one is the estimated number needed for expansion by November 1976, and 756 is the estimated number required for replacement within five years. One hundred ninety-six will be trained within employing institutions by November 1976.

Patient Benefit Analyst

The utilization of this occupation does not appear to have been realized as of now. There is only an estimated number of 13 employed within the State, with four being estimated as current vacancies. The greater utilization of this occupation by institutions will be increasing.

An estimated 30 more will be needed for expansion by November 1976. Fifteen are estimated for replacement by November 1976. Sixteen is the expected number to be company trained by November 1976.

Pharmacy Helper

Briefly analyzing this occupation, it appears that the employing institutions will be meeting the expansion and replacement personnel needs by training a sufficient number of Pharmacy Helpers within the next five years.

There are an estimated 138 total current positions, and eight of these are estimated as being vacant. Forty-nine is the estimated number needed for expansion; 49 is also the estimated number for replacement through November 1976. Sixty is the expected number to be company trained over this same time period.

Physical Therapy Aide

Again, with just briefly analyzing this profession, the probable anticipated personnel needs appear to justify the establishment and/or continuation of training programs for this occupation.

There are 13 estimated current vacancies, 74 new Physical Therapy Aides are the expected expansion needs by November 1976, and 75 are the estimated replacement needs up to November 1976. Forty-eight is the expected number to be company trained during this same period.

Practical Nursing LPN (Vocational)

In those health institutions interviewed outside the Denver Metro area it was plainly evident of the great need for Practical Nurses. The general comments made by nearly all those interviewed could be best summed up as,

"Nurses are very much needed in rural areas." Again, nearly all the health institutions that were interviewed felt that vocational planners should be more aware of the personnel needs of the rural areas and that specifically more Registered Nurses and Licensed Practical Nurses were needed for these areas.

The response towards specific questions were as follows; more LPN's were employed on a part-time basis than any other occupation studied. The greatest difficulty in filling any of the occupations studied was that of the LPN. The reasons they gave for this difficulty were the geographic location of the health institutions and the shortage of training facilities in rural areas.

Licensed Practical Nurses were listed, and compiled to be the third most critical occupation to the operation of their institutions. This occupation was recorded and compiled to have the fifth highest turnover in the most critical category. The reason most generally given for this was the mobility of the LPN and the corresponding solution was to train more local people.

Practical Nurses, along with Registered Nurses, were jointly listed as number one in the need to retrain those presently employed to adjust to the changing health care systems. These two occupations were also listed jointly as number one for what occupation those interviewed felt would be their greatest need, of all those studied, in five years.

Again, the institutional representatives that were interviewed listed Licensed Practical Nurse as fifth in response to the question of " ...Which occupations do you feel there is a need to establish training programs?"

The Licensed Practical Nurse plays just as significant a part in the

Denver area Health Institutions as in those outside the Denver Metro area. The LPN occupation is listed as the position with the greatest difficulty in filling. The reasons that were given were the low wages, and not many were adequately trained for the duties that were required to perform.

The Practical Nurse was listed by the Denver Metro area institutional representatives interviewed as the second most critical profession to the operation of their institution. It has the fourth highest turnover in the Denver Metro area, and reasons cited were low wages and long hours. To reduce this turnover rate they suggested improved working conditions, higher pay and better organization within. More LPN's are used on a part-time basis than any other occupation of those studied.

The training needs of LPN's listed by the Denver Metro Area health representatives were equally as strong as those in the more rural areas. Licensed Practical Nurses were listed as second in the need for additional training to perform their tasks more efficiently. They were listed third in the need for retraining to adjust to the changing health care systems.

Nurses, both RN's and LPN's, were jointly listed first in the occupation that would be of greatest need in five years.

Having 4,537 as the appraised total current position of LPN's, it ranks third highest in total employees of those occupations studied. There are 368 estimated vacancies in the State. Six hundred forty-eight is the expected number needed for expansion by November 1976, and 2,009 are estimated to be needed for replacement for this same time period. The expected number to be company-trained is 1,121 for this same period.

A careful analysis of this occupation will be required by vocational planners in setting up educational programs for this occupation. Factors

which are not readily evident need to be considered in estimating the needed supply of LPN's for the next five years. The importance of this occupation by all employing health institutions was made to be quite evident. Equally evident is the need for additonal training and retraining of those currently employed.

## Registered Nurse

The occupations of Professional Nurse R.N. (B.A. degree or higher) and Technical Nurse R.N. (Associate degree and Diploma), will be combined for general purposes of analysis. After interviewing was completed and all mail questionnaires returned, it was determined that most respondents who employed Registered Nurses of either type did not distinguish between the two, but generally just put their RN's in the Professional Nurse category. Therefore, in viewing professional nurse and technical nurse in the tables, consider both occupations under one profession -- "Registered Nurse."

The critical part that Registered Nurses assume in the operation of various health institutions is clearly apparent. Both geographic groups of health institutions interviewed listed Registered Nurse as the most critical occupation in the operation of their organization.

Those institutions interviewed outside the Denver area listed RN's as the second most difficult occupation to fill. The reasons given were geographic location of the health institutions and the shortage of training in rural areas, advancement limitations, low pay, and primarily, the young, mobile work force. Some of the solutions mentioned were creation of interest in small communities, greater recognition of work and higher pay. (Also, RN was the second largest group being employed on a part-time basis within these health institutions outside the Denver Metro area.)

The Registered Nurse occupation was listed jointly with Licensed Practical Nurse as first in the need for retraining to adjust to the changing health care systems. They were listed jointly again, in response to the question of which of the studied occupations would have the greatest need in five years.

The health institutions interviewed in both the Denver Metro and outlying area had similar conclusions concerning the Registered Nurses. The main differences in their responses were that the Denver Area health institutions experience a higher turnover in this occupation than did rural areas in the State. With younger nurses more recently trained, they did not mention the need to retrain their employed RN's. Some of the listed reasons for the turnover were moving and marriage, and the only solution mentioned was an increase in pay.

The Denver Metropolitan health institutions interviewed stated the greatest need over the next five years in the occupations studied would be nurses.

There are 565 estimated current vacancies for Registered Nurses. It was estimated that 1,210 will be needed for expansion by November 1976, and 5,627 for replacement for this same time period. The responding health institutions expected to train 1,052 by November 1976. The estimated expected total number of positions by the end of this period is 11,503.

It should be emphasized that, in several cases, the institutions interviewed were providing "clinical" experience for a RN program in a nearby school. This tended to inflate the number trained by health institutions, since they were not the primary training agency. The above data indicate a need for continuing and expanding RN training programs as well as for increased emphasis by all training agencies on in-service, and upgrading programs for Registered Nurses.

## Psychiatric Technician

This occupation is relatively stable. There are an estimated 1,501 employed in the State with 28 current vacancies. Both the expansion and replacement needs through November 1976 are moderate. Forty new Psychiatric Technicians are the estimated needs for the five year period and 63 will be needed for replacement. Four are expected to be trained by the employing institutions.

## Public Health Nurse

It is definite that a number of well-qualified Public Health Nurses be available each year to meet the personnel requirements for this position.

With an estimated 407 total current positions, 166 is the calculated number needed for expansion by November 1976. One hundred sixty-one are the anticipated replacements needed for this time period. Public Health Nurses will not be institutionally trained, therefore, all the trained Public Health Nurses must come from outside training institutions.

A careful evaluation by occupational education planners is needed to determine the training and background necessary to fill the positions of Public Health Nurse. It appears that with a minimum of additional course work, persons for this occupation could be trained as a part of existing RN training programs.

## Radiation Therapy Technician

With just a preliminary analysis of this occupation, it appears that training programs should be formulated to produce a limited number of Radiation Therapy Technicians annually.

Four is the anticipated number to be company-trained within five years. Twenty-one is the estimated number needed for expansion, and 21

is the expected replacement need through November 1976.

Radiologic Technician

The representatives of the health institutions interviewed within the Denver Metropolitan area listed the occupation of Radiologic Technician as third most critical to the operation of their organizations. With this explicit significance, the personnel needs of this occupation must be viewed carefully.

With an estimated 731 employed in the State, there are 33 estimated current vacancies. Two-hundred are the probable expansion needs through the November 1976. Approximately two-fifths (225) of those needed are expected to be company-trained through the next five years.

Surgical Technician

This occupation appears to have its personnel needs partially met by company training programs much like that of the Radiologic Technician.

The anticipated number needed for expansion is 114, for replacement, 179, and those to be company trained, 138. These estimates are all over the projected period of the next five years.

Technical Nurse R.N.

(See Registered Nurse. The occupations of Professional Nurse R.N. and Technical Nurse R.N. were combined into the Registered Nurse Occupation.)

Ward Clerk

Ward Clerk was listed sixth by representatives of health institutions outside the Denver Metropolitan area as one of those occupations least critical to the operation of their institution. This occupation was also listed by health institutions outside the Denver Metro area as experiencing

a large turnover. They attributed this to the mobility of the individuals in the occupation and the low pay. Only one solution was presented -- to train local people.

This occupation should be analyzed to determine the type and amount of training necessary for the position. Two hundred forty is the estimated number needed for expansion by November 1976, 710 the estimated need for replacement over the same period, and 208 expected to be company-trained over the next five years.

## Limitations of the Findings

When analyzing the data, the reader should keep in mind that the estimates represent only the expectations of employers at one particular point in time. As such, the survey was affected by the economic and industrial pressures at that time. Also, the estimates and resultant projections would be more accurate and definite trends in the industries could be more firmly established, if studies of this nature were conducted on a regular periodic basis. The projections the employers made were on their specific institutions, and no consideration was taken for new health institutions entering the field.

Care must be taken in interpreting the cells which contain very small numbers due to the sampling error inherent. For example, an information cell containing "3" may best be interpreted as a range: "1-5". Even so, these data represent the best estimates available to planners from any one or any combination of sources.

TABLE 5

CURRENT AND FIVE YEAR OUTLOOK FOR SELECTED HEALTH OCCUPATIONS IN THE STATE OF COLORADO

| OCCUPATION | Number Employed in Sample | Estimated Number Employed in State | Estimated Current Vacancies in State | Estimated Total Current Positions | Estimated No. Needed for Expansion by Nov. 1976 | Expected Total Positions by Nov. 1976 | Estimated No. Needed for Replacement by Nov. 1976 | 1/Expected No. to be Co. Trained by Nov. 1976 |
|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 111 | 182 | 10 | 192 | 25 | 217 | 30 | 3 |
| Bio-Medical Equipment Technician | 52 | 86 | 13 | 99 | 66 | 165 | 30 | 84 |
| Cytotechnician | 150 | 246 | 3 | 249 | 30 | 279 | 14 | 0 |
| Dental Assistant | 169 | 1,014 | 66 | 1,080 | 96 | 1,176 | 566 | 18 |
| Dental Hygienist | 57 | 341 | 24 | 365 | 36 | 401 | 115 | 0 |
| Dental Laboratory Technician | 123 | 202 | 7 | 209 | 92 | 301 | 33 | 18 |
| Dietary Aide | 1,420 | 2,335 | 125 | 2,460 | 312 | 2,772 | 853 | 285 |
| E.C.G. Technician | 198 | 326 | 7 | 333 | 46 | 379 | 122 | 33 |
| E.E.G. Technician | 43 | 71 | 4 | 75 | 33 | 108 | 49 | 15 |
| Food Service Supervisor | 282 | 464 | 18 | 482 | 36 | 518 | 111 | 19 |
| Histological Technician | 68 | 111 | 0 | 111 | 26 | 137 | 69 | 41 |
| Home Health Aide | 25 | 41 | 13 | 54 | 46 | 100 | 41 | 19 |
| Housekeeper | 1,191 | 1,958 | 78 | 2,036 | 260 | 2,296 | 598 | 137 |
| Inhalation Therapist | 298 | 490 | 31 | 521 | 64 | 585 | 217 | 58 |
| Medical Computer Programmer | 8 | 13 | 3 | 16 | 36 | 52 | 10 | 3 |
| Medical Emergency Technician | 58 | 96 | 3 | 99 | 84 | 183 | 60 | 3 |
| Medical Insurance Clerk | 438 | 729 | 31 | 760 | 107 | 867 | 220 | 18 |
| Medical Laboratory Technician | 824 | 1,355 | 66 | 1,421 | 248 | 1,669 | 439 | 437 |
| Medical Laboratory Assistant | 249 | 409 | 25 | 434 | 72 | 506 | 171 | 16 |
| Medical Office Assistant | 429 | 705 | 40 | 745 | 149 | 894 | 125 | 31 |
| Medical Librarian | 80 | 131 | 11 | 142 | 19 | 161 | 30 | 4 |
| Medical Records Clerk | 398 | 654 | 36 | 690 | 84 | 774 | 207 | 81 |
| Medical Records Technician | 123 | 202 | 10 | 212 | 49 | 261 | 85 | 33 |
| Medical Stenographer | 366 | 601 | 30 | 631 | 70 | 701 | 163 | 33 |
| Mental Health Worker | 134 | 220 | 16 | 236 | 63 | 299 | 41 | 3 |
| Mental Retardation Technician | 202 | 332 | 11 | 343 | 11 | 354 | 271 | 202 |
| Nuclear Medicine Technician | 49 | 81 | 10 | 91 | 30 | 121 | 60 | 19 |
| Nurse Aide | 6,972 | 11,464 | 878 | 12,342 | 1,214 | 13,556 | 6,452 | 2,094 |
| Occupational Therapy Aide | 74 | 123 | 13 | 136 | 52 | 188 | 48 | 16 |
| Optic Mechanic | 12 | 19 | 0 | 19 | 3 | 22 | 4 | 0 |
| Optic Technician | 6 | 10 | 0 | 10 | 0 | 10 | 0 | 0 |
| Orderly | 814 | 1,339 | 167 | 1,506 | 410 | 1,907 | 756 | 196 |
| Patient Benefit Analyst | 8 | 13 | 4 | 17 | 30 | 47 | 15 | 16 |
| Pharmacy Helper | 79 | 130 | 8 | 138 | 49 | 187 | 49 | 60 |
| Physical Therapy Aide | 113 | 185 | 13 | 198 | 74 | 272 | 75 | 48 |
| Practical Nursing LPN (Vocational) | 2,536 | 4,169 | 368 | 4,537 | 648 | 5,185 | 2,009 | 1,121 |
| Professional Nurse RN (BA Deg or higher) | 5,042 | 8,291 | 449 | 8,740 | 1,121 | 9,861 | 4,584 | 1,009 |
| Psychiatric Technician | 913 | 1,501 | 28 | 1,529 | 40 | 1,569 | 63 | 4 |
| Public Health Nurse | 227 | 373 | 34 | 407 | 166 | 573 | 161 | 0 |
| Radiation Therapy Technician | 26 | 43 | 0 | 43 | 21 | 64 | 21 | 4 |
| Radiologic Technician | 445 | 731 | 33 | 764 | 200 | 964 | 367 | 225 |
| Surgical Technician | 193 | 317 | 21 | 338 | 114 | 452 | 179 | 138 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 874 | 1,437 | 116 | 1,553 | 89 | 1,642 | 1,043 | 43 |
| Ward Clerk | 794 | 1,306 | 70 | 1,376 | 240 | 1,616 | 710 | 208 |
| Other | 126 | 207 | 15 | 222 | 36 | 258 | 40 | 4 |

1/ Detail may not add to total due tc rounding

TABLE 6

CURRENT AND FIVE-YEAR OUTLOOK FOR SELECTED HEALTH OCCUPATIONS IN REGION 1 - CENTRAL

| OCCUPATION | Number Employed in Sample | Estimated Number Employed in Region | Estimated Current Vacancies in Region | Estimated Total Current Positions | Estimated No. Needed for Expansion by Nov. 1976 | Expected Total Positions by Nov. 1976 | Estimated No. Needed for Replacement by Nov. 1976 | 1/Expected No. to be Co. Trained by Nov. 1976 |
|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 60 | 99 | 1 | 100 | 8 | 108 | 7 | 0 |
| Bio-Medical Equipment Technician | 16 | 26 | 10 | 36 | 46 | 82 | 16 | 0 |
| Cytotechnician | 52 | 86 | 1 | 87 | 13 | 100 | 4 | 0 |
| Dental Assistant | 123 | 738 | 54 | 792 | 84 | 876 | 510 | 12 |
| Dental Hygienist | 48 | 288 | 12 | 300 | 30 | 330 | 108 | 0 |
| Dental Laboratory Technician | 114 | 188 | 7 | 195 | 86 | 281 | 32 | 18 |
| Dietary Aide | 529 | 869 | 31 | 900 | 72 | 972 | 219 | 71 |
| E.C.G. Technician | 101 | 166 | 1 | 167 | 32 | 199 | 78 | 21 |
| E.E.G. Technician | 20 | 32 | 1 | 33 | 16 | 49 | 21 | 7 |
| Food Service Supervisor | 108 | 178 | 4 | 182 | 8 | 190 | 30 | 0 |
| Histological Technician | 44 | 72 | 0 | 72 | 15 | 87 | 25 | 8 |
| Home Health Aide | 22 | 36 | 3 | 39 | 19 | 58 | 26 | 13 |
| Housekeeper | 535 | 880 | 34 | 914 | 69 | 983 | 207 | 54 |
| Inhalation Therapist | 223 | 367 | 16 | 383 | 41 | 424 | 152 | 43 |
| Medical Computer Programmer | 6 | 10 | 0 | 10 | 25 | 35 | 1 | 0 |
| Medical Emergency Technician | 31 | 50 | 1 | 51 | 64 | 115 | 34 | 1 |
| Medical Insurance Clerk | 237 | 390 | 11 | 401 | 56 | 456 | 111 | 0 |
| Medical Laboratory Technician | 531 | 873 | 10 | 883 | 125 | 1,008 | 263 | 164 |
| Medical Laboratory Assistant | 141 | 231 | 13 | 244 | 40 | 284 | 77 | 1 |
| Medical Librarian | 43 | 71 | 3 | 74 | 7 | 81 | 15 | 1 |
| Medical Records Clerk | 200 | 329 | 10 | 339 | 41 | 380 | 100 | 16 |
| Medical Records Technician | 50 | 82 | 1 | 83 | 28 | 111 | 19 | 1 |
| Medical Stenographer | 230 | 378 | 13 | 391 | 36 | 427 | 74 | 8 |
| Mental Health Worker | 86 | 141 | 11 | 152 | 18 | 170 | 19 | 0 |
| Mental Retardation Technician | 32 | 51 | 1 | 52 | 7 | 59 | 8 | 0 |
| Nuclear Medicine Technician | 39 | 64 | 3 | 67 | 10 | 77 | 23 | 13 |
| Nurse Aide | 3,374 | 5,548 | 311 | 5,859 | 567 | 6,426 | 3,080 | 1,034 |
| Occupational Therapy Aide | 15 | 25 | 4 | 29 | 19 | 48 | 19 | 3 |
| Optic Mechanic | 10 | 16 | 0 | 16 | 3 | 19 | 1 | 0 |
| Optic Technician | 3 | 4 | 0 | 4 | 0 | 4 | 0 | 0 |
| Orderly | 542 | 891 | 59 | 950 | 294 | 1,244 | 464 | 49 |
| Patient Benefit Analyst | 7 | 11 | 1 | 12 | 15 | 27 | 1 | 0 |
| Pharmacy Helper | 44 | 72 | 1 | 73 | 21 | 94 | 25 | 8 |
| Physical Therapy Aide | 63 | 104 | 4 | 108 | 21 | 129 | 40 | 25 |
| Practical Nursing LPN (Vocational) | 1,341 | 2,205 | 133 | 2,338 | 256 | 2,594 | 1,100 | 656 |
| Professional Nurse RN (BA Deg or Higher) | 3,603 | 5,924 | 215 | 6,139 | 736 | 6,875 | 3,585 | 571 |
| Psychiatric Technician | 148 | 253 | 7 | 260 | 16 | 276 | 31 | 1 |
| Public Health Nurse | 160 | 263 | 21 | 284 | 120 | 404 | 114 | 0 |
| Radiation Therapy Technician | 13 | 21 | 0 | 21 | 10 | 31 | 7 | 4 |
| Radiologic Technician | 256 | 420 | 13 | 433 | 92 | 525 | 214 | 54 |
| Surgical Technician | 97 | 160 | 4 | 164 | 31 | 195 | 90 | 25 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 198 | 326 | 19 | 345 | 43 | 388 | 106 | 3 |
| Ward Clerk | 560 | 921 | 40 | 961 | 169 | 1,130 | 511 | 136 |
| Other | 75 | 123 | 8 | 131 | 30 | 161 | 32 | 1 |

1/ Detail may not add to total due to rounding

TABLE 7

CURRENT AND FIVE-YEAR OUTLOOK FOR SELECTED OCCUPATIONS IN REGION 2 - NORTHEASTERN

| OCCUPATION | Number Employed in Sample | Estimated Number Employed in Region | Estimated Current Vacancies in Region | Estimated Total Current Positions | Estimated No. Needed for Expansion by Nov. 1976 | Expected Total Positions by Nov. 1976 | Estimated No. Needed for Replacement by Nov. 1976 | 1/Expected No. to be Co. Trained by Nov. 1976 |
|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 25 | 41 | 0 | 41 | 4 | 45 | 8 | 0 |
| Bio-Medical Equipment Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cytotechnician | 2 | 3 | 0 | 3 | 4 | 7 | 4 | 0 |
| Dental Assistant | 3 | 18 | 0 | 18 | 0 | 18 | 0 | 0 |
| Dental Hygienist | 1 | 6 | 0 | 6 | 0 | 6 | 0 | 0 |
| Dental Laboratory Technician | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| Dietary Aide | 167 | 275 | 7 | 282 | 4 | 286 | 114 | 15 |
| E.C.G. Technician | 20 | 32 | 0 | 32 | 1 | 33 | 8 | 8 |
| E.E.G. Technician | 3 | 4 | 0 | 4 | 1 | 5 | 3 | 0 |
| Food Service Supervisor | 64 | 105 | 10 | 115 | 4 | 119 | 44 | 8 |
| Histological Technician | 4 | 7 | 0 | 7 | 1 | 8 | 8 | 16 |
| Home Health Aide | 2 | 3 | 7 | 10 | 3 | 13 | 1 | 0 |
| Housekeeper | 136 | 223 | 7 | 230 | 4 | 234 | 82 | 21 |
| Inhalation Therapist | 11 | 18 | 0 | 18 | 3 | 21 | 16 | 11 |
| Medical Computer Programmer | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Medical Emergency Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Insurance Clerk | 50 | 82 | 0 | 82 | 4 | 86 | 19 | 3 |
| Medical Laboratory Technician | 52 | 86 | 15 | 101 | 3 | 104 | 26 | 82 |
| Medical Laboratory Assistant | 14 | 23 | 3 | 26 | 0 | 26 | 19 | 0 |
| Medical Office Assistant | 43 | 71 | 3 | 74 | 11 | 85 | 11 | 0 |
| Medical Librarian | 6 | 10 | 0 | 10 | 1 | 11 | 0 | 0 |
| Medical Records Clerk | 44 | 72 | 4 | 76 | 7 | 83 | 26 | 1 |
| Medical Records Technician | 16 | 26 | 1 | 27 | 4 | 31 | 13 | 0 |
| Medical Stenographer | 30 | 49 | 7 | 56 | 10 | 66 | 28 | 3 |
| Mental Health Worker | 1 | 1 | 1 | 2 | 3 | 5 | 1 | 0 |
| Mental Retardation Technician | 3 | 4 | 0 | 4 | 0 | 4 | 1 | 0 |
| Nuclear Medicine Technician | 3 | 4 | 0 | 4 | 3 | 7 | 1 | 0 |
| Nurse Aide | 1,087 | 1,787 | 275 | 2,062 | 118 | 2,180 | 1,376 | 311 |
| Occupational Therapy Aide | 9 | 15 | 0 | 15 | 3 | 18 | 1 | 1 |
| Optic Mechanic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 47 | 77 | 10 | 87 | 3 | 90 | 74 | 28 |
| Patient Benefit Analyst | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pharmacy Helper | 6 | 10 | 0 | 10 | 0 | 10 | 10 | 0 |
| Physical Therapy Aide | 7 | 11 | 3 | 14 | 23 | 37 | 8 | 0 |
| Practical Nursing LPN (Vocational) | 262 | 431 | 69 | 500 | 56 | 556 | 220 | 15 |
| Professional Nurse RN (BA Deg or Higher) | 289 | 475 | 46 | 521 | 26 | 547 | 294 | 1 |
| Psychiatric Technician | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 |
| Public Health Nurse | 10 | 16 | 0 | 16 | 4 | 20 | 1 | 0 |
| Radiation Therapy Technician | 2 | 3 | 0 | 3 | 0 | 3 | 3 | 0 |
| Radiologic Technician | 46 | 75 | 7 | 82 | 28 | 110 | 44 | 71 |
| Surgical Technician | 12 | 19 | 0 | 19 | 3 | 22 | 11 | 0 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 164 | 270 | 19 | 289 | 15 | 304 | 577 | 7 |
| Ward Clerk | 37 | 60 | 0 | 60 | 0 | 60 | 54 | 1 |
| Other | 6 | 10 | 1 | 11 | 1 | 12 | 3 | 1 |

1/ Detail may not add to total due to rounding

TABLE 8

CURRENT AND FIVE-YEAR OUTLOOK FOR SELECTED OCCUPATIONS IN REGION 3 - SOUTHEASTERN

| OCCUPATION | Number Employed in Sample | Estimated Number Employed in Region | Estimated Current Vacancies in Region | Estimated Total Current Positions | Estimated No. Needed for Expansion by Nov. 1976 | Expected Total Positions by Nov. 1976 | Estimated No. Needed for Replacement by Nov. 1976 | 1/ Expected No. to be Co. Trained by Nov. 1976 |
|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 19 | 31 | 7 | 38 | 11 | 49 | 15 | 1 |
| Bio-Medical Equipment Technician | 36 | 59 | 3 | 62 | 19 | 81 | 13 | 82 |
| Cytotechnician | 85 | 140 | 1 | 141 | 8 | 149 | 7 | 0 |
| Dental Assistant | 36 | 216 | 12 | 228 | 12 | 240 | 42 | 6 |
| Dental Hygienist | 6 | 60 | 6 | 66 | 0 | 66 | 0 | 0 |
| Dental Laboratory Technician | 6 | 10 | 0 | 10 | 7 | 17 | 0 | 0 |
| Dietary Aide | 492 | 809 | 30 | 839 | 84 | 923 | 260 | 78 |
| E.C.G. Technician | 55 | 90 | 4 | 94 | 10 | 104 | 32 | 4 |
| E.E.G. Technician | 7 | 11 | 3 | 14 | 11 | 25 | 23 | 8 |
| Food Service Supervisor | 83 | 136 | 1 | 137 | 1 | 138 | 28 | 1 |
| Histological Technician | 12 | 19 | 0 | 19 | 8 | 27 | 28 | 16 |
| Home Health Aide | 1 | 1 | 0 | 1 | 18 | 19 | 10 | 7 |
| Housekeeper | 348 | 577 | 16 | 588 | 28 | 616 | 111 | 28 |
| Inhalation Therapist | 38 | 63 | 8 | 71 | 7 | 78 | 36 | 0 |
| Medical Computer Programmer | 1 | 1 | 3 | 4 | 10 | 14 | 8 | 4 |
| Medical Emergency Technician | 22 | 36 | 1 | 37 | 11 | 48 | 21 | 0 |
| Medical Insurance Clerk | 83 | 136 | 11 | 147 | 19 | 166 | 50 | 4 |
| Medical Laboratory Technician | 150 | 246 | 21 | 267 | 13 | 280 | 67 | 67 |
| Medical Laboratory Assistant | 62 | 101 | 7 | 108 | 7 | 115 | 40 | 7 |
| Medical Office Assistant | 77 | 126 | 10 | 136 | 23 | 159 | 21 | 30 |
| Medical Librarian | 17 | 28 | 7 | 35 | 8 | 43 | 10 | 0 |
| Medical Records Clerk | 113 | 186 | 11 | 197 | 16 | 213 | 51 | 19 |
| Medical Records Technician | 35 | 58 | 4 | 62 | 0 | 62 | 28 | 1 |
| Medical Stenographer | 67 | 110 | 3 | 113 | 7 | 120 | 32 | 3 |
| Mental Health Worker | 40 | 66 | 3 | 69 | 30 | 99 | 19 | 0 |
| Mental Retardation Technician | 6 | 10 | 0 | 10 | 4 | 14 | 4 | 4 |
| Nuclear Medicine Technician | 7 | 11 | 7 | 18 | 15 | 33 | 34 | 4 |
| Nurse Aide | 1,774 | 2,917 | 141 | 3,058 | 160 | 3,218 | 1,154 | 246 |
| Occupational Therapy Aide | 47 | 77 | 3 | 80 | 28 | 108 | 19 | 7 |
| Optic Mechanic | 2 | 3 | 0 | 3 | 0 | 3 | 3 | 0 |
| Optic Technician | 3 | 4 | 0 | 4 | 0 | 4 | 0 | 0 |
| Orderly | 160 | 263 | 86 | 349 | 40 | 389 | 141 | 32 |
| Patient Benefit Analyst | 1 | 1 | 1 | 2 | 11 | 13 | 11 | 13 |
| Pharmacy Helper | 21 | 34 | 0 | 34 | 1 | 35 | 3 | 0 |
| Physical Therapy Aide | 31 | 50 | 3 | 53 | 25 | 78 | 21 | 23 |
| Practical Nursing LPN (Vocational) | 642 | 1,055 | 59 | 1,114 | 100 | 1,214 | 334 | 81 |
| Professional Nurse RN (BA Deg or higher) | 754 | 1,240 | 101 | 1,341 | 86 | 1,427 | 352 | 93 |
| Psychiatric Technician | | 1,258 | 21 | 1,279 | 14 | 1,293 | 31 | 0 |
| Public Health Nurse | 40 | 66 | 11 | 77 | 37 | 114 | 46 | 0 |
| Radiation Therapy Technician | 8 | 13 | 0 | 13 | 11 | 24 | 11 | 0 |
| Radiologic Technician | 69 | 114 | 3 | 117 | 3 | 120 | 31 | 26 |
| Surgical Technician | 49 | 81 | 7 | 88 | 31 | 119 | 37 | 26 |
| Technical Nurse RN (Assoc Deg + Diploma) | 339 | 556 | 30 | 586 | 18 | 604 | 192 | 28 |
| Ward Clerk | 135 | 222 | 10 | 232 | 19 | 251 | 60 | 13 |
| Other | 15 | 25 | 3 | 28 | 0 | 28 | 3 | 1 |

1/ Detail may not add to total due to rounding

TABLE 9

CURRENT AND FIVE YEAR OUTLOOK FOR SELECTED OCCUPATIONS IN REGION 4 - WESTERN

| OCCUPATION | Number Employed in Sample | Estimated Number Employed in Region | Estimated Current Vacancies in Region | Estimated Total Current Positions | Estimated No. Needed for Expansion by Nov. 1976 | Expected Total Positions by Nov. 1976 | Estimated No. Needed for Replacement by Nov. 1976 | 1/Expected No. to be Co. Trained by Nov. 1976 |
|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 7 | 11 | 1 | 12 | 0 | 12 | 0 | 1 |
| Bio-Medical Equipment Technician | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| Cytotechnician | 11 | 18 | 0 | 18 | 1 | 19 | 0 | 0 |
| Dental Assistant | 7 | 42 | 0 | 42 | 0 | 42 | 12 | 0 |
| Dental Hygienist | 2 | 12 | 6 | 18 | 6 | 24 | 6 | 0 |
| Dental Laboratory Technician | 2 | 3 | 0 | 3 | 0 | 3 | 0 | 0 |
| Dietary Aide | 232 | 382 | 58 | 440 | 149 | 589 | 261 | 120 |
| E.C.G. Technician | 22 | 36 | 0 | 36 | 1 | 37 | 1 | 0 |
| E.E.G. Technician | 13 | 21 | 0 | 21 | 3 | 24 | 0 | 0 |
| Food Service Supervisor | 27 | 44 | 0 | 44 | 21 | 65 | 10 | 10 |
| Histological Technician | 8 | 13 | 0 | 13 | 1 | 14 | 8 | 0 |
| Home Health Aide | 0 | 0 | 0 | 0 | 4 | 4 | 3 | 0 |
| Housekeeper | 172 | 282 | 19 | 301 | 158 | 459 | 196 | 34 |
| Inhalation Therapist | 26 | 43 | 7 | 50 | 4 | 54 | 13 | 3 |
| Medical Computer Programmer | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| Medical Emergency Technician | 5 | 8 | 0 | 8 | 7 | 15 | 4 | 1 |
| Medical Insurance Clerk | 68 | 111 | 8 | 119 | 25 | 144 | 37 | 11 |
| Medical Laboratory Technician | 91 | 149 | 19 | 168 | 106 | 274 | 82 | 123 |
| Medical Laboratory Assistant | 32 | 51 | 1 | 52 | 28 | 80 | 36 | 8 |
| Medical Office Assistant | 48 | 78 | 1 | 79 | 4 | 83 | 23 | 0 |
| Medical Librarian | 14 | 23 | 1 | 24 | 3 | 27 | 4 | 3 |
| Medical Records Clerk | 41 | 67 | 10 | 77 | 18 | 95 | 28 | 41 |
| Medical Records Technician | 22 | 36 | 1 | 37 | 16 | 53 | 23 | 30 |
| Medical Stenographer | 39 | 64 | 7 | 71 | 18 | 89 | 26 | 18 |
| Mental Health Worker | 7 | 11 | 0 | 11 | 11 | 22 | 0 | 3 |
| Mental Retardation Technician | 161 | 264 | 10 | 274 | 0 | 274 | 256 | 197 |
| Nuclear Medicine Technician | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Nurse Aide | 737 | 1,211 | 149 | 1,360 | 370 | 1,730 | 842 | 505 |
| Occupational Therapy Aide | 3 | 4 | 4 | 8 | 1 | 9 | 7 | 3 |
| Optic Mechanic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 65 | 106 | 15 | 121 | 63 | 184 | 77 | 86 |
| Patient Benefit Analyst | 0 | 0 | 1 | 1 | 3 | 4 | 1 | 3 |
| Pharmacy Helper | 8 | 13 | 7 | 20 | 26 | 46 | 11 | 51 |
| Physical Therapy Aide | 12 | 19 | 1 | 20 | 4 | 24 | 7 | 0 |
| Practical Nursing LPN (Vocational) | 291 | 479 | 106 | 585 | 231 | 816 | 356 | 371 |
| Professional Nurse RN (BA Deg or higher) | 396 | 651 | 84 | 735 | 271 | 1,006 | 353 | 344 |
| Psychiatric Technician | 0 | 0 | 0 | 0 | 7 | 7 | 0 | 3 |
| Public Health Nurse | 17 | 28 | 1 | 29 | 3 | 32 | 0 | 0 |
| Radiation Therapy Technician | 3 | 4 | 0 | 4 | 0 | 4 | 0 | 0 |
| Radiologic Technician | 74 | 122 | 8 | 130 | 77 | 207 | 75 | 72 |
| Sugical Technician | 35 | 58 | 10 | 68 | 48 | 116 | 40 | 87 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 173 | 285 | 46 | 331 | 13 | 344 | 166 | 4 |
| Ward Clerk | 62 | 101 | 19 | 120 | 50 | 170 | 84 | 50 |
| Other | 30 | 49 | 1 | 50 | 3 | 53 | 0 | 0 |

1/ Detail may not add to total due to rounding

TABLE 10

ESTIMATED OUTLOOK BY OCCUPATION AND BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976
FOR EXPANSION AND REPLACEMENT NEEDS IN THE STATE OF COLORADO

| OCCUPATION | Estimated Number Needed for Expansion by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | Total Expansion in 5 Years | Estimated Number Needed for Replacement by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | 1/Total Replacement in 5 Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 7 | 8 | 1 | 0 | 8 | 25 | 7 | 8 | 1 | 7 | 8 | 30 |
| Bio-Medical Equipment Technician | 15 | 15 | 16 | 4 | 15 | 66 | 7 | 7 | 4 | 4 | 7 | 30 |
| Cytotechnician | 0 | 8 | 7 | 1 | 13 | 30 | 1 | 1 | 3 | 3 | 7 | 16 |
| Dental Assistant | 12 | 54 | 18 | | 12 | 96 | 354 | 72 | 36 | 54 | 54 | 564 |
| Dental Hygienist | 18 | 6 | 6 | | 6 | 36 | 12 | 42 | 18 | 24 | 18 | 114 |
| Dental Laboratory Technician | 15 | 21 | 10 | 19 | 26 | 92 | 10 | 8 | 1 | 8 | 4 | 33 |
| Dietary Aide | 66 | 66 | 52 | 67 | 59 | 312 | 12 | 171 | 122 | 152 | 149 | 853 |
| E.C.G. Technician | 7 | 11 | 4 | 8 | 15 | 46 | 10 | 21 | 19 | 23 | 28 | 122 |
| E.E.G. Technician | 1 | 4 | 3 | 4 | 18 | 33 | 260 | 8 | 7 | 15 | 19 | 49 |
| Food Service Supervisor | 10 | 10 | 3 | 7 | 7 | 36 | 31 | 26 | 16 | 18 | 26 | 111 |
| Histological Technician | 3 | 3 | 8 | 3 | 8 | 26 | 1 | 13 | 15 | 13 | 16 | 69 |
| Home Health Aide | 11 | 13 | 7 | 3 | 11 | 46 | 25 | 10 | 8 | 4 | 11 | 41 |
| Housekeeper | 52 | 51 | 55 | 49 | 51 | 260 | 13 | 120 | 93 | 114 | 130 | 598 |
| Inhalation Therapist | 11 | 10 | 23 | 3 | 16 | 64 | 7 | 40 | 36 | 40 | 48 | 217 |
| Medical Computer Programmer | 3 | 8 | 10 | 4 | 10 | 36 | 146 | 1 | 1 | 3 | 3 | 10 |
| Medical Emergency Technician | 7 | 7 | 18 | 15 | 36 | 84 | 52 | 15 | 11 | 13 | 18 | 60 |
| Medical Insurance Clerk | 30 | 18 | 19 | 19 | 18 | 107 | 46 | 44 | 37 | 44 | 48 | 220 |
| Medical Laboratory Technician | 40 | 48 | 34 | 51 | 77 | 248 | 121 | 111 | 72 | 67 | 71 | 439 |
| Medical Laboratory Assistant | 8 | 23 | 11 | 11 | 18 | 72 | 36 | 40 | 34 | 28 | 33 | 171 |
| Medical Office Assistant | 25 | 40 | 67 | 8 | 10 | 149 | 26 | 31 | 31 | 13 | 23 | 125 |
| Medical Librarian | 7 | 4 | 1 | 1 | 4 | 19 | 4 | 7 | 4 | 4 | 7 | 30 |
| Medical Records Clerk | 19 | 26 | 4 | 19 | 13 | 84 | 58 | 37 | 34 | 34 | 36 | 207 |
| Medical Records Technician | 13 | 7 | 3 | 11 | 13 | 49 | 14 | 19 | 13 | 18 | 19 | 86 |
| Medical Stenographer | 16 | 11 | 11 | 10 | 21 | 71 | 40 | 36 | 25 | 26 | 34 | 162 |
| Mental Health Worker | 16 | 15 | 16 | 8 | 7 | 63 | 7 | 7 | 3 | 13 | 15 | 41 |
| Mental Retardation Technician | 3 | 1 | 0 | 1 | 4 | 11 | 63 | 67 | 0 | 70 | 71 | 271 |
| Nuclear Medicine Technician | 1 | 3 | 10 | 8 | 7 | 30 | 7 | 8 | 19 | 11 | 16 | 60 |
| Nurse Aide | 309 | 261 | 207 | 169 | 266 | 1,214 | 1,574 | 1,306 | 1,066 | 1,233 | 1,273 | 6,452 |
| Occupational Therapy Aide | 18 | 15 | 8 | 4 | 7 | 52 | 4 | 10 | 7 | 10 | 16 | 48 |
| Optic Mechanic | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 4 | 4 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 105 | 63 | 67 | 81 | 84 | 401 | 179 | 118 | 137 | 155 | 166 | 756 |
| Patient Benefit Analyst | 4 | 10 | 4 | 3 | 7 | 30 | 1 | 1 | 3 | 1 | 3 | 4 | 15 |
| Pharmacy Helper | 7 | 8 | 11 | 4 | 16 | 49 | 7 | 10 | 10 | 10 | 11 | 49 |
| Physical Therapy Aide | 10 | 34 | 13 | 4 | 11 | 74 | 18 | 16 | 11 | 11 | 18 | 75 |
| Practical Nursing LPN (Vocational) | 140 | 146 | 105 | 140 | 116 | 648 | 597 | 376 | 322 | 356 | 356 | 2,009 |
| Professional Nurse RN (BA Deg or higher) | 245 | 245 | 171 | 268 | 190 | 1,121 | 1,164 | 886 | 791 | 855 | 886 | 4,584 |
| Psychiatric Technician | 10 | 4 | 7 | 10 | 8 | 40 | 15 | 10 | 11 | 13 | 15 | 63 |
| Public Health Nurse | 21 | 33 | 33 | 36 | 41 | 166 | 25 | 30 | 23 | 37 | 45 | 161 |
| Radiation Therapy Technician | 1 | 4 | 3 | 4 | 7 | 21 | 4 | 3 | 3 | 4 | 4 | 21 |
| Radiologic Technician | 40 | 51 | 34 | 36 | 41 | 201 | 72 | 75 | 63 | 69 | 86 | 367 |
| Surgical Technician | 19 | 21 | 18 | 31 | 23 | 114 | 34 | 40 | 26 | 36 | 36 | 179 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 31 | 25 | 7 | 16 | 10 | 89 | 276 | 197 | 181 | 194 | 194 | 1,043 |
| Ward Clerk | 40 | 46 | 40 | 54 | 60 | 240 | 160 | 134 | 114 | 151 | 149 | 710 |
| Other | 8 | 10 | 7 | 4 | 7 | 36 | 10 | 11 | 4 | 7 | 4 | 40 |

1/ Detail May not add to total due to rounding

TABLE 11

ESTIMATED OUTLOOK BY OCCUPATION AND BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976
FOR EXPANSION AND FOR REPLACEMENT NEEDS IN REGION 1 - CENTRAL

| OCCUPATION | Estimated Number Needed for Expansion by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | Total Expansion in 5 Years | Estimated Number Needed for Replacement by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | 1/ Total Replacement in 5 Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 1 | 3 | 0 | 0 | 3 | 8 | 1 | 3 | 0 | 0 | 0 | 7 |
| Bio-Medical Equipment Technician | 11 | 11 | 15 | 0 | 8 | 46 | 4 | 3 | 3 | 1 | 3 | 16 |
| Cytotechnician | 0 | 0 | 3 | 0 | 10 | 13 | 0 | 1 | 0 | 1 | 1 | 4 |
| Dental Assistant | 12 | 48 | 12 | 0 | 12 | 84 | 348 | 54 | 24 | 42 | 42 | 510 |
| Dental Hygienist | 18 | 0 | 6 | | 6 | 30 | 12 | 30 | 18 | 24 | 18 | 108 |
| Dental Laboratory Technician | 15 | 19 | 8 | 19 | 23 | 86 | 10 | 8 | 1 | 8 | 4 | 32 |
| Dietary Aide | 10 | 15 | 11 | 23 | 15 | 72 | 78 | 46 | 19 | 32 | 41 | 219 |
| E.C.G. Technician | 4 | 10 | 4 | 4 | 4 | 32 | 18 | 15 | 13 | 13 | 18 | 78 |
| E.E.G. Technician | 1 | 3 | 1 | 0 | 10 | 16 | 1 | 1 | 1 | 4 | 11 | 21 |
| Food Service Supervisor | 1 | 1 | 0 | 0 | 3 | 8 | 8 | 3 | 4 | 3 | 8 | 30 |
| Histological Technician | 1 | 0 | 4 | 1 | 7 | 15 | 4 | 3 | 4 | 3 | 8 | 25 |
| Home Health Aide | 1 | 1 | 4 | 1 | 10 | 19 | 3 | 7 | 7 | 3 | 7 | 26 |
| Housekeeper | 10 | 13 | 15 | 16 | 15 | 69 | 48 | 36 | 30 | 40 | 51 | 207 |
| Inhalation Therapist | 4 | 7 | 21 | 3 | 13 | 48 | 41 | 30 | 23 | 30 | 31 | 152 |
| Medical Computer Programmer | 3 | 4 | 8 | 1 | 7 | 25 | 0 | 1 | 0 | 0 | 0 | 1 |
| Medical Emergency Technician | 7 | 4 | 16 | 11 | 25 | 64 | 3 | 7 | 7 | 8 | 10 | 34 |
| Medical Insurance Clerk | 13 | 11 | 13 | 13 | 7 | 56 | 28 | 25 | 13 | 26 | 18 | 111 |
| Medical Laboratory Technician | 15 | 19 | 13 | 26 | 50 | 125 | 67 | 58 | 49 | 43 | 46 | 263 |
| Medical Laboratory Assistant | 1 | 16 | 7 | 7 | 10 | 40 | 11 | 15 | 21 | 11 | 18 | 77 |
| Medical Office Assistant | 10 | 28 | 60 | 7 | 3 | 110 | 16 | 15 | 13 | 10 | 13 | 69 |
| Medical Librarian | 3 | 1 | 0 | 0 | 1 | 7 | 3 | 1 | 3 | 3 | 1 | 15 |
| Medical Records Clerk | 8 | 16 | 3 | 8 | 4 | 41 | 25 | 19 | 18 | 19 | 18 | 100 |
| Medical Records Technician | 4 | 4 | 3 | 7 | 8 | 28 | 1 | 3 | 3 | 7 | 4 | 19 |
| Medical Stenographer | 7 | 7 | 10 | 3 | 10 | 36 | 18 | 16 | 11 | 15 | 15 | 74 |
| Mental Health Worker | 4 | 3 | 4 | 1 | 3 | 18 | 4 | 4 | 1 | 4 | 7 | 19 |
| Mental Retardation Technician | 3 | 1 | 0 | 0 | 1 | 7 | 1 | 1 | 0 | 3 | 1 | 8 |
| Nuclear Medicine Technician | 0 | 1 | 4 | 1 | 1 | 10 | 4 | 0 | 10 | 1 | 7 | 23 |
| Nurse Aide | 174 | 90 | 86 | 111 | 104 | 567 | 739 | 585 | 520 | 601 | 633 | 3,080 |
| Occupational Therapy Aide | 7 | 4 | 1 | 1 | 4 | 19 | 1 | 4 | 4 | 1 | 7 | 19 |
| Optic Mechanic | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 1 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 67 | 44 | 50 | 67 | 64 | 294 | 93 | 69 | 90 | 104 | 106 | 464 |
| Patient Benefit Analyst | 1 | 7 | 3 | 0 | 3 | 15 | 0 | 0 | 0 | 0 | 1 | 1 |
| Pharmacy Helper | 1 | 4 | 7 | 0 | 8 | 21 | 3 | 4 | 4 | 4 | 7 | 25 |
| Physical Therapy Aide | 1 | 10 | 4 | 0 | 4 | 21 | 4 | 15 | 4 | 7 | 8 | 40 |
| Practical Nursing LPN (Vocational) | 59 | 40 | 44 | 64 | 50 | 256 | 305 | 210 | 173 | 205 | 204 | 1,100 |
| Professional Nurse RN (BA Deg or higher) | 167 | 138 | 110 | 194 | 126 | 736 | 840 | 702 | 621 | 704 | 715 | 3,[illegible] |
| Psychiatric Technician | 3 | 1 | 3 | 3 | 4 | 16 | 11 | 4 | 3 | 7 | 7 | 31 |
| Public Health Nurse | 7 | 18 | 28 | 30 | 37 | 120 | 15 | 18 | 23 | 25 | 32 | 114 |
| Radiation Therapy Technician | 1 | 1 | 1 | 1 | 3 | 10 | 1 | 1 | 1 | 0 | 1 | 7 |
| Radiologic Technician | 15 | 19 | 16 | 18 | 23 | 92 | 37 | 43 | 32 | 44 | 54 | 214 |
| Surgical Technician | 4 | 11 | 1 | 10 | 3 | 31 | 16 | 23 | 15 | 18 | 18 | 90 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 13 | 16 | 0 | 13 | 0 | 43 | 25 | 26 | 18 | 19 | 13 | 106 |
| Ward Clerk | 30 | 26 | 30 | 41 | 43 | 169 | 110 | 99 | 84 | 115 | 105 | 511 |
| Other | 7 | 10 | 7 | 4 | 3 | 30 | 7 | 10 | 4 | 4 | 4 | 32 |

1/ Detail may not add to total due to rounding

TABLE 12

ESTIMATED OUTLOOK BY OCCUPATION AND BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976
FOR EXPANSION AND FOR REPLACEMENT NEEDS IN REGION 2 - NORTHEASTERN

| OCCUPATION | Estimated Number Needed for Espansion by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | Total Expansion in 5 Years | Estimated Number Needed for Replacement by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | 1/Total Replacement in 5 Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 1 | 0 | 0 | 0 | 1 | 4 | 1 | 1 | 0 | 1 | 1 | 8 |
| Bio-Medical Equipment Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cytotechnician | 0 | 4 | 0 | 0 | 0 | 4 | 1 | 0 | 1 | 0 | 1 | 4 |
| Dental Assistant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Hygienist | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Laboratory Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dietary Aide | 1 | 1 | 0 | 0 | 1 | 4 | 44 | 25 | 16 | 15 | 16 | 114 |
| E.C.G. Technician | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| E.E.G. Technician | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 |
| Food Service Supervisor | 3 | 1 | 0 | 0 | 0 | 4 | 8 | 13 | 3 | 8 | 10 | 44 |
| Histological Technician | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| Home Health Aide | 1 | 1 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 1 |
| Housekeeper | 1 | 1 | 0 | 0 | 0 | 4 | 30 | 15 | 13 | 15 | 11 | 82 |
| Inhalation Therapist | 3 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 16 |
| Medical Computer Programmer | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Emergency Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Insurance Clerk | 0 | 1 | 3 | 0 | 0 | 4 | 4 | 3 | 4 | 1 | 4 | 19 |
| Medical Laboratory Technician | 1 | 1 | 0 | 0 | 0 | 3 | 10 | 4 | 4 | 3 | 3 | 26 |
| Medical Laboratory Assistant | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 3 | 3 | 3 | 19 |
| Medical Librarian | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Office Assistant | 3 | 4 | 1 | 0 | 1 | 11 | 1 | 4 | 4 | 0 | 0 | 11 |
| Medical Records Clerk | 0 | 1 | 0 | 1 | 1 | 7 | 10 | 3 | 3 | 3 | 4 | 26 |
| Medical Records Technician | 1 | 1 | 0 | 1 | 0 | 4 | 3 | 3 | 1 | 3 | 1 | 13 |
| Medical Stenographer | 4 | 0 | 1 | 0 | 3 | 10 | 7 | 7 | 8 | 3 | 3 | 28 |
| Mental Health Worker | 0 | 1 | 1 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 1 |
| Mental Retardation Technician | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Nuclear Medicine Technician | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 |
| Nurse Aide | 4 | 19 | 0 | 0 | 93 | 118 | 356 | 286 | 255 | 243 | 235 | 1,376 |
| Occupational Therapy Aide | 1 | 1 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 1 |
| Optic Mechanic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 1 | 1 | 0 | 0 | 0 | 3 | 21 | 13 | 13 | 13 | 13 | 74 |
| Patient Benefit Analyst | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pharmacy Helper | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 1 | 1 | 10 |
| Physical Therapy Aide | 3 | 18 | 1 | 0 | 0 | 23 | 4 | 0 | 1 | 0 | 1 | 8 |
| Practical Nursing LPN (Vocational) | 10 | 32 | 4 | 3 | 4 | 56 | 59 | 58 | 43 | 31 | 28 | 220 |
| Professional Nurse (BA Deg or higher) | 7 | 11 | 1 | 1 | 4 | 26 | 78 | 66 | 58 | 41 | 49 | 294 |
| Psychiatric Technician | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Public Health Nurse | 1 | 3 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 1 |
| Radiation Therapy Technician | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 |
| Radiologic Technician | 7 | 13 | 3 | 3 | 1 | 28 | 8 | 10 | 11 | 7 | 10 | 44 |
| Surgical Technician | 3 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 1 | 1 | 1 | 11 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 8 | 3 | 1 | 0 | 1 | 15 | 125 | 116 | 111 | 111 | 115 | 577 |
| Ward Clerk | 0 | 0 | 0 | 0 | 0 | 1 | 15 | 7 | 10 | 10 | 10 | 54 |
| Other | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 |

1/ Detail may not add to total due to rounding

TABLE 13

ESTIMATED OUTLOOK BY OCCUPATION AND BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976
FOR EXPANSION AND FOR REPLACEMENT NEEDS IN REGION 3 - SOUTHEASTERN

| OCCUPATION | Estimated Number Needed for Expansion by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | Total Expansion in 5 years | Estimated Number Needed for Replacement by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | 1/ Total Replacement in 5 years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 3 | 3 | 0 | 0 | 3 | 11 | 1 | 3 | 0 | 3 | 4 | 15 |
| Bio-Medical Equipment Technician | 1 | 3 | 1 | 4 | 7 | 18 | 1 | 3 | 1 | 3 | 3 | 13 |
| Cytotechnician | 0 | 0 | 3 | 1 | 3 | 8 | 0 | 0 | 1 | 1 | 3 | 7 |
| Dental Assistant | 0 | 6 | 6 | 0 | 0 | 12 | 6 | 6 | 12 | 6 | 12 | 42 |
| Dental Hygienist | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Laboratory Technician | 0 | 1 | 1 | 0 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dietary Aide | 23 | 15 | 13 | 16 | 16 | 84 | 81 | 48 | 37 | 54 | 40 | 260 |
| E.C.G. Technician | 0 | 1 | 0 | 3 | 3 | 10 | 8 | 4 | 4 | 8 | 8 | 32 |
| E.E.G. Technician | 0 | 0 | 1 | 4 | 4 | 11 | 0 | 4 | 4 | 8 | 8 | 23 |
| Food Service Supervisor | 0 | 1 | 0 | 0 | 0 | 1 | 4 | 7 | 7 | 4 | 7 | 28 |
| Histological Technician | 0 | 3 | 1 | 1 | 1 | 8 | 4 | 7 | 7 | 7 | 7 | 28 |
| Home Health Aide | 8 | 4 | 1 | 1 | 1 | 18 | 0 | 1 | 1 | 1 | 4 | 10 |
| Housekeeper | 7 | 4 | 7 | 4 | 4 | 28 | 25 | 19 | 21 | 19 | 25 | 111 |
| Inhalation Therapist | 3 | 3 | 0 | 0 | 0 | 7 | 7 | 4 | 8 | 8 | 11 | 36 |
| Medical Computer Programmer | 0 | 1 | 1 | 3 | 3 | 10 | 0 | 0 | 1 | 3 | 3 | 8 |
| Medical Emergency Technician | 1 | 0 | 3 | 3 | 3 | 11 | 1 | 4 | 4 | 4 | 7 | 21 |
| Medical Insurance Clerk | 7 | 3 | 1 | 1 | 4 | 19 | 7 | 11 | 10 | 10 | 13 | 50 |
| Medical Laboratory Technician | 3 | 3 | 1 | 1 | 1 | 13 | 19 | 28 | 7 | 7 | 7 | 67 |
| Medical Laboratory Assistant | 0 | 3 | 1 | 0 | 0 | 7 | 10 | 13 | 7 | 7 | 4 | 40 |
| Medical Office Assistant | 10 | 7 | 3 | 1 | 3 | 23 | 7 | 7 | 7 | 1 | 1 | 21 |
| Medical Librarian | 1 | 1 | 1 | 1 | 1 | 8 | 1 | 1 | 1 | 1 | 1 | 10 |
| Medical Records Clerk | 3 | 7 | 1 | 1 | 1 | 16 | 15 | 10 | 10 | 8 | 10 | 51 |
| Medical Records Technician | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 8 | 4 | 8 | 28 |
| Medical Stenographer | 0 | 3 | 0 | 1 | 0 | 7 | 7 | 8 | 4 | 4 | 8 | 32 |
| Mental Health Worker | 8 | 8 | 7 | 3 | 3 | 30 | 0 | 1 | 1 | 8 | 8 | 19 |
| Mental Retardation Technician | 0 | 0 | 0 | 1 | 3 | 4 | 0 | 0 | 0 | 1 | 3 | 4 |
| Nuclear Medicine Technician | 0 | 0 | 4 | 4 | 4 | 15 | 1 | 7 | 10 | 10 | 10 | 34 |
| Nurse Aide | 37 | 48 | 23 | 25 | 26 | 160 | 326 | 229 | 155 | 202 | 241 | 1,154 |
| Occupational Therapy Aide | 10 | 8 | 7 | 1 | 1 | 28 | 0 | 3 | 1 | 7 | 8 | 19 |
| Optic Mechanic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 18 | 8 | 4 | 7 | 3 | 40 | 51 | 21 | 16 | 23 | 28 | 141 |
| Patient Benefit Analyst | 1 | 1 | 1 | 3 | 3 | 11 | 1 | 1 | 1 | 3 | 3 | 11 |
| Pharmacy Helper | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 3 |
| Physical Therapy Aide | 3 | 4 | 4 | 4 | 7 | 25 | 4 | 1 | 4 | 3 | 7 | 21 |
| Practical Nursing LPN (Vocational) | 21 | 31 | 18 | 21 | 8 | 100 | 163 | 44 | 43 | 43 | 37 | 334 |
| Professional Nurse RN (BA Deg. or higher) | 21 | 28 | 11 | 13 | 11 | 86 | 181 | 43 | 37 | 41 | 48 | 352 |
| Psychiatric Technician | 1 | 1 | 3 | 3 | 3 | 13 | 3 | 7 | 8 | 8 | 8 | 31 |
| Public Health Nurse | 13 | 10 | 7 | 4 | 4 | 37 | 8 | 11 | 0 | 13 | 13 | 46 |
| Radiation Therapy Technician | 0 | 3 | 1 | 3 | 3 | 11 | 1 | 1 | 1 | 3 | 3 | 11 |
| Radiologic Technician | 1 | 0 | 0 | 0 | 0 | 3 | 11 | 7 | 4 | 4 | 4 | 31 |
| Surgical Technician | 4 | 3 | 4 | 10 | 8 | 31 | 4 | 7 | 4 | 8 | 11 | 37 |
| Technical Nurse RN (Assoc. Deg. + Diploma) | 3 | 4 | 3 | 3 | 3 | 18 | 93 | 21 | 23 | 25 | 30 | 192 |
| Ward Clerk | 19 | 11 | 10 | 8 | 13 | 60 | 19 | 11 | 10 | 8 | 13 | 60 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 |

1/ Detail may not add to total due to rounding

TABLE 14

ESTIMATED OUTLOOK BY OCCUPATION AND BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976
FOR EXPANSION AND FOR REPLACEMENT NEEDS IN REGION 4 - WESTERN

| OCCUPATION | Estimated Number Needed for Expansion by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | Total Expansion in 5 Years | Estimated Number Needed for Replacement by Year (Nov. 1972 thru Nov. 1976) 1972 | 1973 | 1974 | 1975 | 1976 | 1/ Total Replacement in 5 Years |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activities Director (Senior Citizen) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bio-Medical Equipment Technician | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cytotechnician | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Assistant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 12 |
| Dental Hygienist | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 6 |
| Dental Laboratory Assistant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dietary Aide | 31 | 34 | 28 | 26 | 26 | 149 | 56 | 51 | 48 | 51 | 54 | 261 |
| E.C.G. Technician | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| E.E.G. Technician | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Food Service Supervisor | 4 | 3 | 3 | 4 | 3 | 23 | 1 | 1 | 1 | 1 | 1 | 10 |
| Histological Technician | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| Home Health Aide | 0 | 4 | 0 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 0 | 3 |
| Housekeeper | 34 | 31 | 32 | 30 | 31 | 158 | 44 | 46 | 26 | 40 | 40 | 196 |
| Inhalation Therapist | 0 | 0 | 1 | 0 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 13 |
| Medical Computer Programmer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Emergency Technician | 0 | 0 | 0 | 0 | 7 | 7 | 0 | 3 | 1 | 0 | 1 | 4 |
| Medical Insurance Clerk | 10 | 0 | 3 | 4 | 4 | 25 | 7 | 4 | 8 | 4 | 10 | 37 |
| Medical Laboratory Technician | 19 | 23 | 21 | 21 | 2 | 106 | 18 | 21 | 11 | 15 | 15 | 82 |
| Medical Laboratory Assistant | 7 | 3 | 3 | 4 | 8 | 28 | 10 | 7 | 3 | 8 | 8 | 36 |
| Medical Office Assistant | 1 | 0 | 1 | 0 | 0 | 4 | 1 | 4 | 7 | 1 | 8 | 23 |
| Medical Librarian | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 1 | 4 |
| Medical Records Clerk | 7 | 0 | 0 | 7 | 3 | 18 | 8 | 3 | 3 | 3 | 7 | 28 |
| Medical Records Technician | 7 | 0 | 0 | 3 | 4 | 16 | 7 | 4 | 1 | 3 | 7 | 23 |
| Medical Stenographer | 3 | 1 | 0 | 4 | 7 | 18 | 8 | 4 | 1 | 4 | 8 | 26 |
| Mental Health Worker | 3 | 1 | 3 | 3 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mental Retardation Technician | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 66 | 0 | 66 | 66 | 256 |
| Nuclear Medicine Technician | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Nurse Aide | 92 | 104 | 99 | 32 | 43 | 370 | 149 | 205 | 136 | 186 | 161 | 842 |
| Occupational Therapy Aide | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 7 |
| Optic Mechanic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 16 | 10 | 13 | 7 | 1 | 63 | 11 | 15 | 16 | 15 | 19 | 77 |
| Patient Benefit Analyst | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 |
| Pharmacy Helper | 4 | 3 | 4 | 4 | 7 | 26 | 1 | 1 | 1 | 3 | 1 | 11 |
| Physical Therapy Aide | 1 | 1 | 1 | 0 | 0 | 4 | 3 | 0 | 0 | 1 | 1 | 7 |
| Practical Nursing LPN (Vocational) | | 43 | 40 | 49 | 51 | 231 | 67 | 63 | 64 | 77 | 87 | 356 |
| Professional Nurse RN (BA Deg or higher) | 49 | 67 | 48 | 59 | 49 | 271 | 64 | 74 | 74 | 69 | 74 | 353 |
| Psychiatrict Technician | 3 | 0 | 0 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Public Health Nurse | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiation Therapy Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiologic Technician | 16 | 18 | 15 | 15 | 15 | 77 | 15 | 16 | 1 | 13 | 16 | 75 |
| Surgical Technician | 7 | 7 | 11 | 11 | 11 | 48 | 10 | 7 | 4 | 8 | 10 | 40 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 7 | 0 | 1 | 0 | 4 | 13 | 32 | 32 | 28 | 37 | 34 | 166 |
| Ward Clerk | 8 | 10 | 7 | 10 | 15 | 50 | 13 | 16 | 11 | 19 | 23 | 84 |
| Other | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

1/ Detail may not add to total due to rounding

TABLE 15

ESTIMATED CURRENT VACANCIES BY EXPANSION AND REPLACEMENT NEEDS AND THE ESTIMATED NUMBER TO BE COMPANY TRAINED BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976, IN EACH OCCUPATION IN THE STATE OF COLORADO

| OCCUPATION | Estimated Number of Vacancies by November 1976 | | | Estimated Number to be Company Trained by Year (Nov. 1972 thru Nov. 1976) | | | | | 1/ Total Number Expected to be Company Trained by November 1976 |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Expansion | Replacement | 1972 | 1973 | 1974 | 1975 | 1976 | |
| Activities Director (Senior Citizen) | 54 | 25 | 30 | 0 | 1 | 0 | 0 | 0 | 1 |
| Bio-Medical Equipment Technician | 97 | 66 | 30 | 8 | 16 | 19 | 19 | 19 | 84 |
| Cytotechnician | 46 | 30 | 16 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Assistant | 660 | 96 | 564 | 6 | 6 | 0 | 6 | 0 | 18 |
| Dental Hygienist | 150 | 36 | 114 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Laboratory Technician | 125 | 92 | 33 | 1 | 1 | 0 | 7 | 8 | 18 |
| Dietary Aide | 1,166 | 312 | 853 | 84 | 49 | 44 | 52 | 56 | 285 |
| E.C.G. Technician | 167 | 46 | 122 | 8 | 4 | 4 | 7 | 7 | 33 |
| E.E.G. Technician | 82 | 33 | 49 | 1 | 0 | 3 | 4 | 4 | 15 |
| Food Service Supervisor | 149 | 36 | 111 | 4 | 3 | 1 | 3 | 4 | 19 |
| Histological Technician | 95 | 26 | 69 | 8 | 8 | 8 | 8 | 10 | 36 |
| Home Health Aide | 87 | 46 | 36 | 11 | 3 | 4 | 0 | 0 | 19 |
| Housekeeper | 858 | 260 | 598 | 25 | 28 | 13 | 30 | 36 | 137 |
| Inhalation Therapist | 281 | 64 | 217 | 10 | 15 | 10 | 11 | 11 | 58 |
| Medical Computer Programmer | 46 | 34 | 10 | 0 | 0 | 0 | 1 | 1 | 3 |
| Medical Emergency Technician | 145 | 84 | 60 | 0 | 1 | 0 | 1 | 1 | 3 |
| Medical Insurance Clerk | 327 | 107 | 220 | 7 | 3 | 1 | 1 | 3 | 18 |
| Medical Laboratory Technician | 687 | 248 | 439 | 90 | 90 | 82 | 87 | 87 | 437 |
| Medical Laboratory Assistant | 245 | 72 | 171 | 4 | 3 | 3 | 1 | 1 | 16 |
| Medical Office Assistant | 275 | 149 | 125 | 7 | 7 | 8 | 8 | 1 | 31 |
| Medical Librarian | 49 | 19 | 30 | 4 | 0 | 0 | 0 | 0 | 4 |
| Medical Records Clerk | 289 | 84 | 207 | 16 | 16 | 13 | 18 | 15 | 81 |
| Medical Records Technician | 134 | 49 | 86 | 10 | 7 | 3 | 4 | 7 | 33 |
| Medical Stenographer | 235 | 71 | 163 | 4 | 7 | 10 | 7 | 4 | 33 |
| Mental Health Worker | 104 | 63 | 41 | 3 | 0 | 0 | 0 | 0 | 3 |
| Mental Retardation Technician | 282 | 11 | 271 | 49 | 49 | 0 | 51 | 52 | 202 |
| Nuclear Medicine Technician | 90 | 30 | 60 | 1 | 1 | 4 | 7 | 4 | 19 |
| Nurse Aide | 7,667 | 1,214 | 6,452 | 583 | 375 | 314 | 408 | 414 | 2,094 |
| Occupational Therapy Aide | 100 | 52 | 48 | 4 | 1 | 1 | 1 | 4 | 16 |
| Optic Mechanic | 8 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 1,158 | 401 | 756 | 34 | 34 | 36 | 44 | 46 | 196 |
| Patient Benefit Analyst | 44 | 30 | 15 | 3 | 3 | 3 | 3 | 3 | 16 |
| Pharmacy Helper | 98 | 49 | 49 | 11 | 11 | 13 | 15 | 13 | 60 |
| Physical Therapy Aide | 151 | 74 | 75 | 8 | 10 | 7 | 10 | 13 | 48 |
| Practical Nursing LPN (Vocational) | 2,655 | 648 | 2,009 | 317 | 226 | 173 | 208 | 196 | 1,121 |
| Professional Nurse RN (BA Deg. or higher) | 5,704 | 1,121 | 4,584 | 240 | 201 | 187 | 194 | 186 | 1,010 |
| Psychiatric Technician | 101 | 40 | 63 | 3 | 0 | 0 | 0 | 1 | 4 |
| Public Health Nurse | 327 | 166 | 161 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiation Therapy Technician | 36 | 21 | 21 | 0 | 0 | 1 | 1 | 1 | 4 |
| Radiologic Technician | 567 | 201 | 367 | 56 | 59 | 36 | 37 | 36 | 225 |
| Surgical Technician | 293 | 114 | 179 | 30 | 21 | 25 | 30 | 33 | 138 |
| Technical Nurse RN (Assoc. Deg + Diploma) | 1,131 | 89 | 1,043 | 11 | 3 | 8 | 3 | 15 | 43 |
| Ward Clerk | 950 | 240 | 710 | 44 | 36 | 36 | 37 | 37 | 201 |
| Other | 74 | 36 | 40 | 0 | 1 | 1 | 0 | 0 | 3 |

1/ Detail may not add to total due to rounding

TABLE 16

ESTIMATED CURRENT VACANCIES BY EXPANSION AND REPLACEMENT NEEDS AND THE ESTIMATED NUMBER TO BE COMPANY TRAINED BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976, IN EACH OCCUPATION OF REGION 1 - CENTRAL

| OCCUPATION | Estimated Number of Vacancies by November 1976 | | | Estimated Number to be Company Trained by Year (Nov. 1972 thru Nov. 1976) | | | | | 1/Total Number Expected to be Company Trained by November 1976 |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Expansion | Replacement | 1972 | 1973 | 1974 | 1975 | 1976 | |
| Activities Director (Senior Citizen) | 15 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bio-Medical Equipment Technician | 63 | 46 | 16 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cytotechnician | 19 | 13 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Assistant | 594 | 84 | 510 | 6 | 0 | 0 | 0 | 6 | 12 |
| Dental Hygienist | 138 | 30 | 510 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Laboratory Technician | 118 | 86 | 32 | 1 | 1 | 0 | 7 | 8 | 18 |
| Dietary Aide | 291 | 72 | 219 | 46 | 10 | 0 | 4 | 10 | 71 |
| E.C.G. Technician | 111 | 32 | 78 | 7 | 3 | 3 | 3 | 3 | 21 |
| E.E.G. Technician | 37 | 16 | 21 | 1 | 0 | 1 | 1 | 1 | 7 |
| Food Service Supervisor | 37 | 8 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| Histological Technician | 37 | 15 | 25 | 1 | 1 | 1 | 1 | 1 | 8 |
| Home Health Aide | 46 | 19 | 26 | 4 | 3 | 4 | 0 | 0 | 13 |
| Housekeeper | 276 | 69 | 207 | 10 | 8 | 1 | 13 | 21 | 54 |
| Inhalation Therapist | 201 | 48 | 152 | 10 | 7 | 8 | 8 | 10 | 43 |
| Medical Computer Programmer | 26 | 25 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Emergency Technician | 99 | 64 | 34 | 0 | 0 | 0 | 0 | 1 | 1 |
| Medical Insurance Clerk | 167 | 56 | 111 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Laboratory Technician | 388 | 125 | 263 | 32 | 32 | 32 | 32 | 32 | 164 |
| Medical Laboratory Assistant | 116 | 40 | 77 | 1 | 0 | 0 | 0 | 0 | 1 |
| Medical Office Assistant | 179 | 110 | 69 | 1 | 0 | 0 | 0 | 0 | 1 |
| Medical Librarian | 21 | 7 | 15 | 1 | 0 | 0 | 0 | 0 | 1 |
| Medical Records Clerk | 141 | 41 | 100 | 4 | 4 | 0 | 4 | 1 | 16 |
| Medical Records Technician | 48 | 28 | 19 | 0 | 0 | 0 | 0 | 1 | 1 |
| Medical Stenographer | 111 | 36 | 74 | 1 | 1 | 1 | 1 | 1 | 8 |
| Mental Health Worker | 36 | 18 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mental Retardation Technician | 15 | 7 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nuclear Medicine Technician | 31 | 10 | 23 | 1 | 1 | 3 | 3 | 3 | 13 |
| Nurse Aide | 3,647 | 567 | 3,080 | 344 | 169 | 160 | 178 | 184 | 1,034 |
| Occupational Therapy Aide | 40 | 19 | 19 | 1 | 0 | 0 | 0 | 1 | 3 |
| Optic Mechanic | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 760 | 294 | 464 | 7 | 8 | 11 | 16 | 4 | 49 |
| Patient Benefit Analyst | 16 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pharmacy Helper | 46 | 21 | 25 | 1 | 1 | 1 | 1 | 1 | 8 |
| Physical Therapy Aide | 60 | 21 | 40 | 4 | 7 | 1 | 4 | 7 | 25 |
| Practical Nursing LPN (Vocational) | 1,356 | 256 | 1,100 | 222 | 138 | 92 | 100 | 101 | 656 |
| Professional Nurse RN (BA Deg. or higher) | 4,320 | 736 | 3,585 | 149 | 104 | 108 | 100 | 110 | 571 |
| Psychiatric Technician | 48 | 16 | 31 | 0 | 0 | 0 | 0 | 1 | 1 |
| Public Health Nurse | 234 | 120 | 114 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiation Therapy Technician | 15 | 10 | 7 | 0 | 0 | 1 | 1 | 1 | 4 |
| Radiologic Technician | 305 | 92 | 214 | 11 | 11 | 10 | 10 | 10 | 54 |
| Surgical Technician | 122 | 31 | 90 | 11 | 3 | 1 | 4 | 3 | 25 |
| Technical Nurse RN (Assoc. Deg. + Diploma) | 151 | 43 | 106 | 1 | 0 | 0 | 0 | 1 | 3 |
| Ward Clerk | 680 | 169 | 511 | 30 | 26 | 26 | 26 | 26 | 136 |
| Other | 63 | 30 | 32 | 0 | 0 | 1 | 0 | 0 | 1 |

1/ Detail may not add to total due to rounding

TABLE 17

ESTIMATED CURRENT VACANCIES BY EXPANSION AND REPLACEMENT NEEDS AND THE ESTIMATED NUMBER TO BE COMPANY TRAINED BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976, IN EACH OCCUPATION OF REGION 2 - NORTHEASTERN

| OCCUPATION | Estimated Number of Vacancies by November 1976 | | | Estimated Number to be Company Trained by Year (Nov. 1972 thru Nov. 1976) | | | | | 1/Total Number Expected to be Company Trained by November 1976 |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Expansion | Replacement | 1972 | 1973 | 1974 | 1975 | 1976 | |
| Activities Director (Senior Citizen) | 13 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bio-Medical Equipment Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cytotechnician | 10 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Assistant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Hygienist | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Laboratory Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dietary Aide | 118 | 4 | 114 | 4 | 3 | 3 | 3 | 1 | 15 |
| E.C.G. Technician | 10 | 1 | 8 | 1 | 1 | 1 | 1 | 1 | 8 |
| E.E.G. Technician | 4 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Food Service Supervisor | 49 | 4 | 44 | 1 | 1 | 0 | 1 | 1 | 8 |
| Histological Technician | 10 | 1 | 8 | 3 | 3 | 3 | 3 | 3 | 16 |
| Home Health Aide | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Housekeeper | 87 | 4 | 82 | 4 | 4 | 4 | 3 | 3 | 21 |
| Inhalation Therapist | 19 | 3 | 16 | 0 | 8 | 0 | 3 | 0 | 11 |
| Medical Computer Programmer | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Emergency Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Insurance Clerk | 26 | 4 | 19 | 1 | 0 | 0 | 0 | 1 | 3 |
| Medical Laboratory Technician | 30 | 3 | 26 | 16 | 16 | 16 | 16 | 16 | 82 |
| Medical Laboratory Assistant | 19 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Office Assistant | 23 | 11 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Librarian | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Records Clerk | 32 | 7 | 26 | 0 | 0 | 0 | 0 | 0 | 1 |
| Medical Records Technician | 18 | 4 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Stenographer | 40 | 10 | 28 | 0 | 0 | 3 | 0 | 0 | 3 |
| Mental Health Worker | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mental Retardation Technician | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nuclear Medicine Technician | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nurse Aide | 1,495 | 118 | 1,376 | 75 | 66 | 46 | 64 | 59 | 311 |
| Occupational Therapy Aide | 4 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| Optic Mechanic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 77 | 3 | 74 | 4 | 7 | 4 | 7 | 4 | 28 |
| Patient Benefit Analyst | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pharmacy Helper | 10 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Physical Therapy Aide | 31 | 23 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Practical Nursing LPN (Vocational) | 276 | 56 | 220 | 4 | 3 | 1 | 3 | 1 | 15 |
| Professional Nurse RN (BA Deg. or higher) | 320 | 26 | 294 | 0 | 0 | 0 | 0 | 0 | 1 |
| Psychiatric Technician | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Public Health Nurse | 7 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiation Therapy Technician | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiologic Technician | 72 | 28 | 44 | 16 | 16 | 13 | 11 | 13 | 71 |
| Surgical Technician | 15 | 3 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| Technical Nurse RN (Assoc. Deg. + Diploma) | 591 | 15 | 577 | 3 | 0 | 3 | 0 | 0 | 7 |
| Ward Clerk | 54 | 0 | 54 | 1 | 0 | 0 | 0 | 0 | 1 |
| Other | 4 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 1 |

1/ Detail may not add to total due to rounding

TABLE 18

ESTIMATED CURRENT VACANCIES BY EXPANSION AND REPLACEMENT NEEDS AND THE ESTIMATED NUMBER TO BE COMPANY TRAINED BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976, IN EACH OCCUPATION OF REGION 3 - SOUTHEASTERN

| OCCUPATION | Estimated Number of Vacancies by November 1976 | | | Estimated Number to be Company Trained by Year (Nov. 1972 thru Nov. 1976) | | | | | 1/Total Number Expected to be Company Trained by November 1976 |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Expansion | Replacement | 1972 | 1973 | 1974 | 1975 | 1976 | |
| Activities Director (Senior Citizen) | 26 | 11 | 15 | 0 | 0 | 0 | 0 | 0 | 1 |
| Bio-Medical Equipment Technician | 31 | 18 | 13 | 7 | 16 | 19 | 19 | 19 | 82 |
| Cytotechnician | 15 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Assistant | 54 | 12 | 42 | 0 | 6 | 0 | 0 | 0 | 6 |
| Dental Hygienist | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Laboratory Technician | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dietary Aide | 344 | 84 | 260 | 15 | 16 | 13 | 18 | 16 | 78 |
| E.C.G. Technician | 41 | 10 | 32 | 0 | 0 | 0 | 1 | 1 | 4 |
| E.E.G. Technician | 34 | 11 | 23 | 0 | 0 | 1 | 3 | 3 | 8 |
| Food Service Supervisor | 30 | 1 | 28 | 0 | 0 | 0 | 0 | 0 | 1 |
| Histological Technician | 36 | 8 | 28 | 3 | 3 | 3 | 3 | 3 | 16 |
| Home Health Aide | 28 | 18 | 10 | 7 | 0 | 0 | 0 | 0 | 7 |
| Housekeeper | 140 | 28 | 111 | 3 | 4 | 3 | 4 | 8 | 28 |
| Inhalation Therapist | 43 | 7 | 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Computer Programmer | 18 | 10 | 8 | 0 | 0 | 0 | 1 | 1 | 3 |
| Medical Emergency Technician | 32 | 11 | 21 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Insurance Clerk | 71 | 19 | 50 | 3 | 0 | 0 | 0 | 0 | 3 |
| Medical Laboratory Technician | 78 | 13 | 67 | 15 | 13 | 13 | 13 | 13 | 67 |
| Medical Laboratory Assistant | 44 | 7 | 40 | 1 | 1 | 1 | 0 | 0 | 7 |
| Medical Office Assistant | 44 | 23 | 21 | 4 | 7 | 8 | 8 | 1 | 30 |
| Medical Librarian | 18 | 8 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Records Clerk | 69 | 16 | 51 | 3 | 4 | 3 | 3 | 3 | 19 |
| Medical Records Technician | 30 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 1 |
| Medical Stenographer | 40 | 7 | 32 | 0 | 0 | 0 | 0 | 1 | 3 |
| Mental Health Worker | 49 | 30 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mental Retardation Technician | 10 | 4 | 4 | 0 | 0 | 0 | 1 | 3 | 4 |
| Nuclear Medicine Technician | 49 | 15 | 34 | 0 | 0 | 1 | 1 | 1 | 4 |
| Nurse Aide | 1,314 | 160 | 1,154 | 63 | 44 | 37 | 46 | 54 | 246 |
| Occupational Therapy Aide | 48 | 28 | 19 | 0 | 1 | 1 | 1 | 1 | 7 |
| Optic Mechanic | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 181 | 40 | 141 | 8 | 3 | 7 | 3 | 11 | 32 |
| Patient Benefit Analyst | 23 | 11 | 11 | 1 | 1 | 3 | 3 | 3 | 13 |
| Pharmacy Helper | 4 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Physical Therapy Aide | 48 | 25 | 21 | 3 | 3 | 4 | 4 | 7 | 23 |
| Practical Nursing LPN (Vocational) | 434 | 100 | 334 | 16 | 18 | 18 | 21 | 10 | 81 |
| Professional Nurse RN (BA Deg. or higher) | 437 | 86 | 352 | 19 | 21 | 16 | 18 | 18 | 93 |
| Psychiatric Technician | 44 | 13 | 31 | 0 | 0 | 0 | 0 | 0 | 0 |
| Public Health Nurse | 84 | 37 | 46 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiation Therapy Technician | 23 | 11 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiologic Technician | 34 | 3 | 31 | 13 | 13 | 0 | 0 | 0 | 26 |
| Surgical Technician | 69 | 31 | 37 | 3 | 3 | 4 | 7 | 8 | 26 |
| Technical Nurse RN (Assoc. Deg. + Diploma) | 210 | 18 | 192 | 7 | 3 | 4 | 3 | 8 | 28 |
| Ward Clerk | 81 | 19 | 60 | 1 | 3 | 3 | 1 | 1 | 13 |
| Other | 3 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 |

1/ Detail may not add to total due to rounding

TABLE 19

ESTIMATED CURRENT VACANCIES BY EXPANSION AND REPLACEMENT NEEDS AND THE ESTIMATED NUMBER TO BE COMPANY TRAINED BY YEAR FROM NOVEMBER 1972 THROUGH NOVEMBER 1976, IN EACH OCCUPATION OF REGION 4 - WESTERN

| OCCUPATION | Estimated Number of Vacancies by November 1976 | | | Estimated Number to be Company Trained by Year (Nov. 1972 thru Nov. 1976) | | | | | 1/Total Number Expected to be Company Trained by November 1976 |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Expansion | Replacement | 1972 | 1973 | 1974 | 1975 | 1976 | |
| Activities Director (Senior Citizen) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Bio-Medical Equipment Technician | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Cytotechnician | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Assistant | 12 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Hygienist | 12 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dental Laboratory Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dietary Aide | 411 | 149 | 261 | 18 | 19 | 28 | 26 | 26 | 120 |
| E.C.G. Technician | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| E.E.G. Technician | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Food Service Supervisor | 31 | 21 | 10 | 3 | 1 | 1 | 1 | 1 | 10 |
| Histological Technician | 10 | 1 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Home Health Aide | 8 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Housekeeper | 353 | 158 | 196 | 4 | 10 | 3 | 8 | 8 | 34 |
| Inhalation Therapist | 18 | 4 | 13 | 0 | 0 | 1 | 0 | 1 | 3 |
| Medical Computer Programmer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Emergency Technician | 13 | 7 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| Medical Insurance Clerk | 63 | 25 | 37 | 1 | 3 | 1 | 1 | 1 | 11 |
| Medical Laboratory Technician | 189 | 106 | 82 | 25 | 28 | 19 | 25 | 25 | 123 |
| Medical Laboratory Assistant | 64 | 28 | 36 | 1 | 1 | 1 | 1 | 1 | 8 |
| Medical Office Assistant | 28 | 4 | 23 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical Librarian | 8 | 3 | 4 | 3 | 0 | 0 | 0 | 0 | 3 |
| Medical Records Clerk | 46 | 18 | 28 | 8 | 7 | 8 | 10 | 10 | 41 |
| Medical Records Technician | 40 | 16 | 23 | 8 | 7 | 3 | 4 | 4 | 30 |
| Medical Stenographer | 44 | 18 | 26 | 3 | 3 | 4 | 3 | 1 | 18 |
| Mental Health Worker | 13 | 11 | 0 | 3 | 0 | 0 | 0 | 0 | 3 |
| Mental Retardation Technician | 256 | 0 | 256 | 49 | 49 | 0 | 49 | 49 | 197 |
| Nuclear Medicine Technician | 3 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| Nurse Aide | 1,211 | 370 | 842 | 100 | 95 | 71 | 120 | 116 | 504 |
| Occupational Therapy Aide | 8 | 1 | 7 | 1 | 0 | 0 | 0 | 1 | 3 |
| Optic Mechanic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Optic Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orderly | 140 | 63 | 77 | 15 | 15 | 15 | 18 | 25 | 86 |
| Patient Benefit Analyst | 4 | 3 | 1 | 1 | 1 | 0 | 0 | 0 | 3 |
| Pharmacy Helper | 37 | 26 | 11 | 10 | 10 | 11 | 13 | 11 | 51 |
| Physical Therapy Aide | 11 | 4 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Practical Nursing LPN (Vocational) | 590 | 231 | 356 | 75 | 67 | 60 | 84 | 82 | 371 |
| Professional Nurse RN (BA Deg. or higher) | 627 | 271 | 353 | 71 | 77 | 60 | 75 | 58 | 344 |
| Psychiatric Technician | 7 | 7 | 0 | 3 | 0 | 0 | 0 | 0 | 3 |
| Public Health Nurse | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiation Therapy Technician | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Radiologic Technician | 152 | 77 | 75 | 15 | 18 | 13 | 16 | 13 | 72 |
| Surgical Technician | 87 | 48 | 40 | 15 | 15 | 18 | 18 | 21 | 87 |
| Technical Nurse RN (Assoc. Deg. + Diploma) | 179 | 13 | 166 | 0 | 0 | 0 | 0 | 4 | 4 |
| Ward Clerk | 134 | 50 | 84 | 11 | 11 | 11 | 10 | 10 | 50 |
| Other | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

1/Detail may not add to total due to rounding

## Appendix A - Methodology

The study was conducted in two parts, one being mail questionnaires, the other personal interviews. Both parts were conducted completely independently, yet the information obtained from each was complementary to the other. The results from the mail questionnaires provided us with detailed statistical information, such as total number currently employed, number of vacancies, their expected expansion and replacement needs, and other similar information. The personal interviews that were conducted furnished us with an indepth picture of each of the selected occupations from the standpoint of health institutions that employ these types of personnel.

### Personal Interviews

Health institutions throughout the State were randomly selected to be interviewed. These institutions were divided into two geographic groups, those within the Denver Metropolitan area and those in the remaining outlying areas of the State. The data obtained was presented in this form in the section, "Analysis of Selected Occupations." (See Table of Contents.)

A letter of introduction was sent to each administrator, or institutional head, explaining the study and identifying the interviewer. The actual interview generally lasted 45 to 60 minutes, yet many were much longer. The information that we received furnished us with an insight into many aspects of the occupations being studied. It also provided us a personal understanding from the demand side of this health manpower analysis.

JOHN A. LOVE, Governor

STATE BOARD FOR COMMUNITY COLLEGES AND OCCUPATIONAL EDUCATION

207 STATE SERVICES BUILDING • 1525 SHERMAN STREET • DENVER, COLORADO 80203

MARVIN G. LINSON, DIRECTOR

JAMES W. WILSON
ASSOCIATE DIRECTOR FOR
OCCUPATIONAL EDUCATION

F. DEAN LILLIE
ASSOCIATE DIRECTOR FOR
COMMUNITY COLLEGES

August 12, 1971

Gentlemen:

This letter is to introduce Ralph M. Hunter who has been employed by the State Board for Community Colleges and Occupational Education in cooperation with the Division of Employment to secure information concerning health services occupations in Colorado. Your institution was selected at random among all the health facilities in the State. All data furnished will be held in strict confidence.

For a study of this magnitude to be a success, it is important that we have your cooperation and assistance. Results of the survey should prove to be beneficial to your industry, and to the future manpower requirements of your institution. If you have any further questions concerning the project, contact me at 222-1551, ext. 444.

Very truly yours,

Kenneth M. Slyziuk
Project Coordinator
Colorado Division of Employment
1210 Sherman, Room 225
Denver, Colorado 80203

KMS/dm

CONFIDENTIAL EMPLOYER REPORT OF MANPOWER NEEDS
IN SELECTED OCCUPATIONS OF HEALTH

**Form H-B**

The State Board for Community Colleges and Occupational Education and the Division of Employment is currently conducting a statewide analysis of the status of health services occupations in Colorado. Your organization's assistance is requested in supplying needed information to make this project a success to form as concise a picture as possible of the current and future status of health industry labor needs in the State. This project is not just another survey among the many, but this promises to be most beneficial to your institution in better utilizing our manpower resources.

All data furnished will, of course, be held in strict confidence and the data published will be by occupation with no individual institution identified. You may be sure that the information you furnish will aid the health industry, educational institutions, and the general public. For a study of this magnitude to be a success, it is imperative that we have your cooperation in this matter.

All technical, auxiliary, sub-professional, paraprofessional, support and allied health personnel holding positions that require less than a four year college degree will be referred to in this survey as sub-professionals. Also, the terms institution and organization will be considered synonomous in this survey.

1. What is your organization's average daily patient census:
   in-patients _____ out-patients _____
2. How many employees are currently working in this health organization? (Please specify part-time employees using the equivalent of a 40-hour work week. For example, an organization may have 3 X-ray technicians but only 1 works 40 hours a week, while the remaining 2 work 20 hours a week each. Therefore, instead of recording 3 for X-ray technicians record 2).
   A. Physicians (Dentists, if applicable)
      1. Resident Practioners _____
      2. Interns _____
      3. Registered Nurses _____
      4. Predominate specialities and number of specialists in each _____

   B. In which of the following categories does your organization employ sub-professionals and how many are employed by your organization in each category? The occupations given in each category are to serve only as examples of occupations the categories could include.
      1. Diagnostic (i.e. X-ray Technician) _____
      2. Treatment (i.e. Nuclear Medicine Technician) _____
      3. Nurturing (i.e. Licensed Practical Nurse or Dietary Aids, etc.) _____
      4. Rehabilitation (i.e. Mental Health Worker) _____
      5. Recordkeeping (i.e. Medical Insurance Clerk) _____
      6. Maintenance (i.e. Bio-Medical Equipment Technician) _____
3. Specifically, in which technical health occupations does your institution employ part-time (those working less than 40 hours a week) health workers? _____

4. A. In which of the sub-professional occupations does your organization have difficulty in filling positions? _____

_____

_____

B. Why do you think this difficulty exists? _____

_____

_____

_____

5. A. In which sub-professional health occupations has your institution experienced a high turn-over rate among employees (list approximate per cent in each occupation per year, also check the occupations that are least and most critical to the operation of your organization)?

| Per Cent | | Least | Most |
|---|---|---|---|
| ____ | Activities Director (Senior Citizen) | ____ | ____ |
| ____ | Bio-Medical Equipment Technician | ____ | ____ |
| ____ | Cytotechnician | ____ | ____ |
| ____ | Dental Assistant | ____ | ____ |
| ____ | Dental Hygienist | ____ | ____ |
| ____ | Dental Laboratory Technician | ____ | ____ |
| ____ | Dietary Aide | ____ | ____ |
| ____ | E.C.G. Technician | ____ | ____ |
| ____ | E.E.G. Technician | ____ | ____ |
| ____ | Food Service Supervisor | ____ | ____ |
| ____ | Histological Technician | ____ | ____ |
| ____ | Home Health Aide | ____ | ____ |
| ____ | Housekeeper | ____ | ____ |
| ____ | Inhalation Therapist | ____ | ____ |
| ____ | Medical Computer Programmer | ____ | ____ |
| ____ | Medical Emergency Technician | ____ | ____ |
| ____ | Medical Insurance Clerk | ____ | ____ |
| ____ | Medical Laboratory Technician | ____ | ____ |
| ____ | Medical Laboratory Assistant | ____ | ____ |
| ____ | Medical Office Assistant | ____ | ____ |
| ____ | Medical Librarian | ____ | ____ |
| ____ | Medical Records Clerk | ____ | ____ |
| ____ | Medical Records Technician | ____ | ____ |
| ____ | Medical Stenographer | ____ | ____ |
| ____ | Mental Health Worker | ____ | ____ |
| ____ | Mental Retardation Technician | ____ | ____ |
| ____ | Nuclear Medicine Technician | ____ | ____ |
| ____ | Nurse Aide | ____ | ____ |
| ____ | Occupational Therapy Aide | ____ | ____ |
| ____ | Optic Mechanic | ____ | ____ |
| ____ | Optic Technician | ____ | ____ |
| ____ | Orderly | ____ | ____ |
| ____ | Patient Benefit Analyst | ____ | ____ |
| ____ | Pharmacy Helper | ____ | ____ |
| ____ | Physical Therapy Aide | ____ | ____ |
| ____ | Practical Nursing | ____ | ____ |
| ____ | Professional Nurse | ____ | ____ |
| ____ | Psychiatric Technician | ____ | ____ |
| ____ | Public Health Nurse | ____ | ____ |
| ____ | Radiation Therapy Technician | ____ | ____ |
| ____ | Radiologic Technician | ____ | ____ |
| ____ | Surgical Technician | ____ | ____ |
| ____ | Technical Nurse | ____ | ____ |
| ____ | Ward Clerk | ____ | ____ |
| ____ | _____ | ____ | ____ |
| ____ | _____ | ____ | ____ |
| ____ | _____ | ____ | ____ |
| ____ | _____ | ____ | ____ |

B. Of the occupations listed in question 5A, why do you think this is the case? _____

C. What could be done to keep the needed sub-professional occupations working in your institution? _____

6. A. Of the technical personnel employed currently in your organization which sub-professional occupations do you feel additional training is needed to perform their tasks more efficiently?

B. Is the training they receive sufficient for the duties they now are expected to perform as opposed to their duties in the past?

C. In which sub-professional occupations do you feel retraining (or refreshing) should take place to adjust to the changing health care systems? _____

D. How often do you think continuing education in the sub-professional occupations you have just listed, be repeated? _____

7. What new or emerging sub-professional health occupation do you see developing at the present time (i.e. Medical Computer Programmer)?

A. In the future, say 5 years, what sub-professional occupation do you think will develop? _____

_____

_____

_____

8. A. What is going to be the greatest need in the sub-professional health occupations in 5 years? _____

_____

_____

_____

B. What should health occupation vocational education planners at community college level and high school vocational level be aware of so that they can develop training programs in anticipation of your perceived needs? _____

_____

_____

_____

9. It is recognized by almost every official in health organizations throughout the State that they feel they are under-staffed. Based on past budget considerations, your observations, your experience, and the knowledge you possess concerning the expected economic conditions of your institution, please answer the following questions concerning your organization's current employment, current positions, replacement needs, expansion needs and your organization's training of workers in fields of - (See Questionnaire)

10. Aside from the sub-professional occupations just mentioned, in which occupations do you feel there is a need to establish training programs? _____

_____

_____

_____

11. Comments _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

## Notes for Interviewers

1. When interviewing a respondent you should convey the thought that he is responding to you based on his institution's past budgets, his observations, his experience, and the knowledge he possesses concerning future economic conditions of his institution.

2. At a hospital or clinic ask to see the personnel administrator or whoever could provide the information we need to have supplied.

3. You might mention, if necessary, that their institution was selected completely at random to be included on a 25 percent sample of all health facilities in the State. Also, that they will receive by mail (if they haven't already) another questionnaire from us that has gone to all health facilities in the State.

4. When conducting the interview, read the questionnaire word for word without influencing the respondent in any way by emphasizing what you may think is important -- remain neutral.

5. Realize that most of the health facilities will not employ each and every occupation listed.

6. Be aware that many health facilities employ part-time help; equate the part-time health personnel into full-time: 8 hours a day, 40 hours a week per job. (See question number 2 on questionnaire form H-B)

7. Note in question number 2, part A, we are interested in the professionals only; in part B we are interested in primarily vocationally trained occupations.

8. In question number 5, we are interested in finding out what the percentage of turn-over rate is in each occupation listed per year and whether or not the respondent considers some of the occupations more critical to their operation than other occupations. Concerning the percentage of turnover, the following example should clarify the information we are seeking: a health facility X has 4 medical laboratory technicians and 2 of them have filled positions occupied by former employees of the institution within the past year. Consequently, you would write 50 under the column headed Percent next to Medical Laboratory Technician.

9. Totally disregard question number 9.

10. In question number 10, the reference "Aside from the sub-professional occupations just mentioned" is the occupations listed in question number 5, part A and any other occupations the respondent had mentioned up to that point in the interview.

## Appendix B -- Mail Questionnaires

A sample of employers was selected from the health field, and other industries which included 31 different four digit industries as defined by the Standard Industrial Classification Manual. (See list of coded industries beginning on page

An attempt was made to sample 100 percent of the above employers subject to the Colorado Employment Security Act throughout the State of Colorado. There were 1376 employers which were known to employ or could reasonably be expected to employ persons in the prelisted occupations on the questionnaire. The entire universe was narrowed down to 844 active employers. These employers were ones who actually did employ those occupations being studied, and who were presently engaged in business activities.

It was possible to select this large sample through the use of electronic data processing. A program was used (ADP 9F00) which would select all employers in the areas of interest from a library tape and bring the addresses onto adhesive labels that were affixed on the back of the questionnaire form and mailed. The mailed envelope contained a cover letter, definitions of terms, instructions, the questionnaire, and a franked pre-addressed return envelope. It was found that this method was fast enough that all employers in any and all industries could be mailed the forms if desired, with little additional work.

### Results of the Administration of the Mail Questionnaire

From the initial mailing, 233 responses were received which makes this a 27% initial return. A second mailing to 614 employers gave us a 38% response, or 237 respondents. It was necessary to send out a

third mailing from which we received 96 responses for a 34% return. Four hundred thirty-four employers were contacted personally both by phone and personal visits. From this, we received a 47% return rate, which indicates that personal contact is the best method possible.

There were 844 employers with 27,219 employees are covered by State unemployment insurance in the industries surveyed.

May 25, 1971

Gentlemen:

The State Board for Community Colleges and Occupational Education and the Division of Employment are conducting a statewide analysis of selected health occupations in Colorado. Health agencies throughout the State are cooperating in this study to assure that the data collected will complement the information gathered in other studies. The purpose of this study is to provide statisitical projections in each health occupation surveyed so that the State Board can plan and develop programs to more accurately meet your training needs.

A list of occupational definitions is enclosed. They have been developed by the Division of Employment and we feel they are applicable to most institutions being covered by the survey. A comments section is provided for you to record any information you think pertinent. All data furnished will be held in strict confidence.

For a study of this magnitude to be a success, it is important that we have your cooperation and assistance. Results of the survey should prove to be beneficial to your industry, and to the future manpower requirements of you institution.

Please return the completed form by June 15, 1971. To insure a high survey return rate, your institution will be contacted again to verify your response after that date. If you have any further questions concerning the project, contact: John E. Conger, Project Coordinator, 222-1551, ext. 444.

The State Board for Community Colleges and Occupational Education and the Division of Employment are most grateful for your assistance in this matter.

Very truly yours,

Randall A. Ruff, Chief
Research and Analysis

Health Occupations Study Advisory Committee Includes Representatives from:

Colorado Careers Council
Colorado Medical Society
Colorado-Wyoming Regional Medical Programs
Comprehensive Health Planning
Department of Institutions
St. Luke's Hospital

September 9, 1971

C
O
P
Y

Gentlemen:

On at least one occasion the State Board for Community Colleges and Occupational Education and the Division of Employment sent your firm a request for assistance in analyzing selected health occupations in Colorado. To date, we have not received your Confidential Employer's Report. In the event the material that was sent to your institution initially has been misplaced, I am including another report for your convenience. If your institution does not employ anyone in the occupations listed, please return the report with a notation to that effect.

Let me stress again that all data furnished will be held in strict confidence and the data published will be by occupation and industry with no individual firm identified.

It is of upmost importance that we have your firm's response to our request for assistance in this vital matter. Your participation is essential in providing us with information that will enable us to make statistical projections in each health occupation surveyed so that the State Board can plan and develop programs to more accurately meet your training needs. Your response does count and we thank you for your cooperation.

Very truly yours,

Randall A. Ruff, Chief
Research and Analysis

Enclosure

July 29, 1971

Gentlemen:

We appreciate the fact that you have responded to our Health Services Study by completing the questionnaire. However, due to a coding error on some responses, it was impossible to distinguish what county the response originated, and what type of industry it was, in the Health Services field. This information is essential for the successful completion of the study.

We apologize for the mishap, and for the request for additional assistance. Yet each reply is essential to form a more accurate picture of the Health Services industry in the State of Colorado. Therefore, if you have a duplicate of the original, and returned to our office as quickly as possible.

Your response does count, and we thank you for your cooperation.

Sincerely,

Randall A. Ruff, Chief
Research and Analysis

Enclosure

Form H-A

# CONFIDENTIAL EMPLOYER REPORT OF MANPOWER NEEDS IN SELECTED OCCUPATIONS OF HEALTH

ID [1 - 4] CC [5 - 6]

| Occupational Title [7 - 8] | [9 - 14] | Current Employment By Occupation 15 - 18 (II) TOTAL | Current Vacancies By Occupation For: 19 - 21 (III) REPLACEMENT | 22 - 24 (IV) EXPANSION | Number of Workers Needed for REPLACEMENT By Occupation In: 25 - 27 1 Yr. | 28 - 30 2 Yrs. | 31 - 33 3 Yrs. | 34 - 36 4 Yrs. | 37 - 39 5 Yrs. (V) | Number of Workers Needed for EXPANSION By Occupation In: 40 - 42 1 Yr. | 43 - 45 2 Yrs. | 46 - 48 3 Yrs. | 49 - 51 4 Yrs. | 52 - 54 5 Yrs. (VI) | Number of Workers Completing Institutional TRAINING Programs By Occupation In: 55 - 57 1 Yr. | 58 - 60 2 Yrs. | 61 - 63 3 Yrs. | 64 - 66 4 Yrs. | 67 - 69 5 Yrs. (VII) | Office Use 70 - 75 (VIII) S. I. C. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Column (I) | | | | | | | | | | | | | | | | | | | | |
| 01. Activities Director (Senior Citizen) | 355.878 | | | | | | | | | | | | | | | | | | | 07.0303 |
| 02. Bio-Medical Equipment Technician | 223.887 | | | | | | | | | | | | | | | | | | | 07.0905 |
| 03. Cytotechnician | 078.281 | | | | | | | | | | | | | | | | | | | 07.0201 |
| 04. Dental Assistant | 079.378 | | | | | | | | | | | | | | | | | | | 07.0101 |
| 05. Dental Hygienist | 078.368 | | | | | | | | | | | | | | | | | | | 07.0102 |
| 06. Dental Laboratory Technician | 712.381 | | | | | | | | | | | | | | | | | | | 07.0103 |
| 07. Dietary Aide | 079.588 | | | | | | | | | | | | | | | | | | | 07.0908 |
| 08. E.C.G. Technician | 078.368 | | | | | | | | | | | | | | | | | | | 07.0902 |
| 09. E.E.G. Technician | 078.368 | | | | | | | | | | | | | | | | | | | 07.0901 |
| 10. Food Service Supervisor | 319.138 | | | | | | | | | | | | | | | | | | | 07.0908 |
| 11. Histological Technician | 078.381 | | | | | | | | | | | | | | | | | | | 07.0202 |
| 12. Home Health Aide | 354.878 | | | | | | | | | | | | | | | | | | | 07.0307 |
| 13. Housekeeper | 321.138 | | | | | | | | | | | | | | | | | | | 09.0205 |
| 14. Inhalation Therapist | 079.368 | | | | | | | | | | | | | | | | | | | 07.0903 |
| 15. Medical Computer Programmer | 213.382 | | | | | | | | | | | | | | | | | | | 14.0202 |

Form H-A

## CONFIDENTIAL EMPLOYER REPORT OF MANPOWER NEEDS IN SELECTED OCCUPATIONS OF HEALTH

ID [1 - 4] CC [5 - 6]

| Occupational Title [7 - 8] [9 - 14] | Current Employment By Occupation | Current Vacancies By Occupation For: | | Number of Workers Needed for REPLACEMENT By Occupation In: | | | | | Number of Workers Needed for EXPANSION By Occupation In: | | | | | Number of Workers Completing Institutional TRAINING Programs By Occupation In: | | | | | Office Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Column (I) | 15 - 18 (II) | 19 - 21 (III) | 22 - 24 (IV) | 25 - 27 | 28 - 30 | 31 - 33 | 34 - 36 | 37 - 39 | 40 - 42 | 43 - 45 | 46 - 48 | 49 - 51 | 52 - 54 | 55 - 57 | 58 - 60 | 61 - 63 | 64 - 66 | 67 - 69 | 70 - 75 (VIII) |
| | TOTAL | RE-PLACE-MENT | EXPAN-SION | (V) 1 Yr. | 2 Yrs. | 3 Yrs. | 4 Yrs. | 5 Yrs. | (VI) 1 Yr. | 2 Yrs. | 3 Yrs. | 4 Yrs. | 5 Yrs. | (VII) 1 Yr. | 2 Yrs. | 3 Yrs. | 4 Yrs. | 5 Yrs. | S. I. C. |
| 16. Medical Emergency Technician | | | | | | | | | | | | | | | | | | | 07.0301 |
| 17. Medical Insurance Clerk | | | | | | | | | | | | | | | | | | | 14.0303 |
| 18. Medical Laboratory Technician | | | | | | | | | | | | | | | | | | | 07.0203 |
| 19. Medical Laboratory Assistant | | | | | | | | | | | | | | | | | | | 07.0203 |
| 20. Medical Office Assistant | | | | | | | | | | | | | | | | | | | 07.0904 |
| 21. Medical Librarian | | | | | | | | | | | | | | | | | | | 14.0303 |
| 22. Medical Records Clerk | | | | | | | | | | | | | | | | | | | 14.0303 |
| 23. Medical Records Technician | | | | | | | | | | | | | | | | | | | 14.0303 |
| 24. Medical Stenographer | | | | | | | | | | | | | | | | | | | 14.0703 |
| 25. Mental Health Worker | | | | | | | | | | | | | | | | | | | 07.0801 |
| 26. Mental Retardation Technician | | | | | | | | | | | | | | | | | | | 07.0802 |
| 27. Nuclear Medicine Technician | | | | | | | | | | | | | | | | | | | 07.0503 |
| 28. Nurse Aide | | | | | | | | | | | | | | | | | | | 07.0303 |
| 29. Occupational Therapy Aide | | | | | | | | | | | | | | | | | | | 07.0401 |
| 30. Optic Mechanic | | | | | | | | | | | | | | | | | | | 07.0601 |

Form H-A

## CONFIDENTIAL EMPLOYER REPORT OF MANPOWER NEEDS IN SELECTED OCCUPATIONS OF HEALTH

ID [1 - 4] CC [5 - 6]

| Occupational Title | Code | Current Employment By Occupation | Current Vacancies By Occupation For: | | Number of Workers Needed for REPLACEMENT By Occupation In: | | | | | Number of Workers Needed for EXPANSION By Occupation In: | | | | | Number of Workers Completing Institutional TRAINING Programs By Occupation In: | | | | | Office Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Column (I) | | 15 - 18 (II) | 19 - 21 (III) | 22 - 24 (IV) | 25 - 27 | 28 - 30 | 31 - 33 | 34 - 36 | 37 - 39 (V) | 40 - 42 | 43 - 45 | 46 - 48 | 49 - 51 | 52 - 54 (VI) | 55 - 57 | 58 - 60 | 61 - 63 | 64 - 66 | 67 - 69 (VII) | 70 - 75 (VIII) |
| [7 - 8] | [9 - 14] | TOTAL | RE-PLACE-MENT | EXPAN-SION | 1 Yr. | 2 Yrs. | 3 Yrs. | 4 Yrs. | 5 Yrs. | 1 Yr. | 2 Yrs. | 3 Yrs. | 4 Yrs. | 5 Yrs. | 1 Yr. | 2 Yrs. | 3 Yrs. | 4 Yrs. | 5 Yrs. | S. I. C. |
| 31. Optic Technician | 007.081 | | | | | | | | | | | | | | | | | | | 07.0601 |
| 32. Orderly | 355.878 | | | | | | | | | | | | | | | | | | | 07.0303 |
| 33. Patient Benefit Analyst | 219.488 | | | | | | | | | | | | | | | | | | | 14.0303 |
| 34. Pharmacy Helper | 074.387 | | | | | | | | | | | | | | | | | | | 07.0203 |
| 35. Physical Therapy Aide | 355.878 | | | | | | | | | | | | | | | | | | | 07.0402 |
| 36. Practical Nursing LPN (Vocational) | 354.878 | | | | | | | | | | | | | | | | | | | 07.0302 |
| 37. Professional Nurse RN (Bachelor's degree or higher) | 075.378 | | | | | | | | | | | | | | | | | | | 07.0301 |
| 38. Psychiatric Technician | 355.878 | | | | | | | | | | | | | | | | | | | 07.0304 |
| 39. Public Health Nurse | 354.878 | | | | | | | | | | | | | | | | | | | 07.0307 |
| 40. Radiation Therapy Technician | 078.368 | | | | | | | | | | | | | | | | | | | 07.0404 |
| 41. Radiologic Technician | 078.368 | | | | | | | | | | | | | | | | | | | 07.0404 |
| 42. Surgical Technician | 079.378 | | | | | | | | | | | | | | | | | | | 07.0306 |
| 43. Technical Nurse RN (Associate degree & diploma) | 075.378 | | | | | | | | | | | | | | | | | | | 07.0399 |
| 44. Ward Clerk | 219.388 | | | | | | | | | | | | | | | | | | | 14.0303 |
| 45. | | | | | | | | | | | | | | | | | | | | |

Form H-A

# CONFIDENTIAL EMPLOYER REPORT ON MANPOWER NEEDS IN SELECTED OCCUPATIONS

ID [1 – 4] CC [5 – 6]

[7 – 8]

**46.** In relation to the health workers employed by your institution for one year or less, how did your institution recruit those workers or if your institution did not employ any new workers how would your institution fill new openings? (In this question would you please circle your preferences in all columns A - H in rank order. For example, possibly your institutions first choice would be A - 'FROM WITHIN YOUR INSTITUTION' - then your response would be to circle one under column A - (1) 2 3 4 5 6 7 8; Your institutions second choice might be D - 'FROM VOCATIONAL SCHOOLS' - 1 (2) 3 4 5 6 7 8; Third might be F - 'FROM PRIVATE EMPLOYMENT AGENCIES' - 1 2 (3) 4 5 6 7 8; etc.) In otherwords you should circle one number according to your institutions preference or employment policy under every lettered alternative.

| [9] A | [10] B | [11] C | [12] D | [13] E | [14] F | [15] G | [16] H |
|---|---|---|---|---|---|---|---|
| FROM WITHIN YOUR INSTITUTION | FROM OTHER INSTITUTIONS | REFERRALS FROM YOUR INSTITUTIONS HEALTH WORKERS | FROM VOCATIONAL SCHOOLS | FROM THE STATE EMPLOYMENT DIVISION | FROM PRIVATE EMPLOYMENT AGENCIES | FROM THE PARTICULAR HEALTH Occupational Organization representing the occupation where your vacancy exists | FROM OTHER SOURCES (i.e. newspapers) |
| 1 2 3 4 5 6 7 8 | 1 2 3 4 5 6 7 8 | 1 2 3 4 5 6 7 8 | 1 2 3 4 5 6 7 8 | 1 2 3 4 5 6 7 8 | 1 2 3 4 5 6 7 8 | 1 2 3 4 5 6 7 8 | 1 2 3 4 5 6 7 8 |

[17 – 18] [19 – 22]

**47.** Your institutions total employment in Colorado of workers in all health occupations, including occupations not covered in this report. _____ _____

**48.** Your comments directed to occupational needs in the health services industry in Colorado. _____

Name of Person filling out this Report. _____

Title _____

Date _____ _____

S.I.C. Do Not Use: [ ]

79

73

## INSTRUCTIONS ON FILLING OUT THE REPORT

You will note that the report is basically divided into eight columns.

Column (I) - Occupational Title - Specific Occupations are stated (01-44) and these occupations are defined in the enclosed "Definitions of Terms". A particular occupational description may not exactly describe the job an employee might perform perfectly but it may be a resonable facsimile of the functions performed. If this is the case, include the worker in the appropriate occupational title that most closely resembles the worker's duties. You will also note at the end of the list of occupational titles number forty-four, space is provided for you to add any occupational titles that you feel are in demand in the health services industry or will be in demand in the future. (Disregard the number following each occupational title, they are for purposes of analyzation).

Column (II) - Current Employment by Occupation - Alluding to current number of employees working for your firm in each occupational titles.

Column (III) - Current Vacancies by Occupation for Replacement - Referring to employees who have recently or will shortly quit, assume other jobs through promotion, have been fired, resigned, retired or for any reason have caused a vacancy that needs to be filled immediately.

Column (IV) - Current Vacancies by Occupation for Expansion- To fit your institution's new needs, caused by such things as - addition of new instruments or machines, development or creation of departments, etc.

Column (V) - Through Column (VII) - All of these columns are dealing with what you perceive as employment needs for your organization in the years to come. Perhaps you know exactly what those projected needs will be, possibly not. If per chance you have no idea of what your organization needs will be five years hence, then give an estimate based on what your employee's needs have been five years ago to the present. In doing so, take into consideration your organiation's current economic condition, future plans, etc. Your responses in this section will be extremely useful in determining what various institutions should do to meet the demand so that workers with the proper training will be on hand when your institution is in need of such workers.

Column (VIII) - Office Use (Only)

In addition to this information, you are also requested at the end of the report to make any comments that relate to occupational needs in the health services that are significant or unique to your organization or a difference in definition of an occupation or any new occupations that are developing in the industry, etc.

Disregard all boxes with numbers contained within them, they are for office use only.

Thank you again for your time and cooperation, it will be most useful and it is appreciated.

## Appendix C

## DEFINITIONS OF TERMS

01. Activities Director (Senior Citizen)
Under professional guidance, encourages and assists persons in a long-term care facility to exercise their abilities. In a planned, coordinated and structured fashion provides activities that are especially beneficial in overcoming specific problems.

02. Bio-Medical Equipment Technician
Assists professionals in tasks related to bio-medical equipment; manufacture testing, sales, calibration, operation, service maintenance and modification of bio-medical equipment.

03. Cytotechnician
Stains, mounts and studies cells of the human body to determine pathological condition. Performs appropriate laboratory tests to confirm findings. Reports information to Pathologist.

04. Dental Assistant
Provides services to patients, under the supervision of the dentist, that include chairside assistance, simple laboratory work, reception and clerical functions.

05. Dental Hygientist
Performs complete oral prophylaxis. Provides dental health education for chairside patients and community health programs. Charts conditions of decay and diseases for diagnosis and treatment by Dentist.

06. Dental Laboratory Technician
Constructs and repairs dental appliances required for oral health of the patient as authorized by the Dentist.

07. Dietary Aide
Under the supervision of a Dietitian or Food Service Supervisor, engages in preparing and serving meals. Is responsible for the cleanliness of equipment and work area. Performs any combination of tasks that includes preparing vegetables, meats, salads, poultry, seafood and breads.

08. E.C.G. Technician
Operates electrocardiograph equipment used in recording electromotive variations of the heart muscle to provide data for diagnosis of heart ailments. Refers tracings to Cardiologist for interpretation.

09. E.E.G. Technician
Operates electroencephalograph equipment that measures impulse frequencies and differences between various portions of the brain. Observation of patient's behavior, made on graph, is sent to referring physician.

10. Food Service Supervisor

Trains and supervises employees engaged in serving food in hospital, nursing home and similar institutions. Maintains cleanliness of food service areas and equipment. Instructs, assigns, and coordinates work in the kitchen and dining room. May assist professional dietitian in planning menus. Keeps records concerning amount and cost of meals, hours worked by employees, stock levels, etc.

11. Histological Technician

Prepares, sections, stains and studies cellular material to provide data for Pathologist. Has a knowledge of methods of preserving tissue. Maintains paraffin, reagents and other solutions and stains according to standard formulas.

12. Home Health Aide

Cares for elderly, convalescent and/or handicapped persons in the patients home. Provides for their activities of daily living which is described by a physician or Public Health Nurse.

13. Housekeeper

Insures clean, orderly and attractive condition of establishment. Inspects and evaluates physical condition of establishment and submits to management recommendations for painting, repairs, furnishings, relocation of equipment and reallocation of space. Periodically inventories supplies and equipment and investigates new and improved cleaning instruments.

14. Inhalation Therapist

Under the physician's supervision administers oxygen, aerosolized solutions and medications, and lung physical therapy. Operates machines which assist or control respiration. May perform pulmonary laboratory test and other procedures in the case of patients with respiratory illnesses.

15. Medical Computer Programmer

Using medical-orientated language, specializes in developing needed formulations. Converts medical formulations to format processable by computer. Observes computer during processing to analyze and correct programming and coding errors.

16. Medical Emergency Technician

Responds to medical emergency calls, takes appropriate prompt action to reduce the medical hazards. Transports patients to medical facility and may act as assistant to the emergency room staff of hospital.

17. Medical Insurance Clerk

Works in the business office. Confirms insurance benefits of each patient with employer. Administrates commercial and governmental insurance claims, out-patient claims for X-ray and emergency room service, and delinquent payment problems.

18. Medical Laboratory Technician

Under supervision of Pathologist, receives from laboratory or from the patient directly, samples of blood, urine, tissue, etc., for quantitative and qualitative, chemical, microscopic and bacteriological tests. With use of microscopes, micrometers and similar instruments, provides data for use in treatment and diagnosis.

19. Medical Laboratory Assistant

Works under the direct supervision of medical technologist, Pathologist, or other qualified physician. Performs relatively difficult cleaning tasks as well as washing laboratory glassware and equipment. Mixes cleaning solutions and acids according to specifications, and assists in cutting tissues and staining slides.

20. Medical Office Assistant

Helps with examiniations and treatments that can be done in a physician's office. May carry out simple related laboratory procedures. Sterilizes instruments and supplies. Records medical histories, maintains medical records, handles telephone calls, correspondence, insurance matters, fees and collections, orders supplies, keeps office accounts and maintains general bookkeeping and housekeeping.

21. Medical Librarian

Analyzes reading needs of patients and provides library services for patients and employees in hospital or similar institutions. Reviews requests, and selects books and other library materials for ward trips according to mental state, educational background, and special needs of patients. Assembles book reviews for hospital bulletins or newspaper, and circulates reviews among patients.

22. Medical Records Clerk

Under supervision of Medical Record Librarian, classifies medical records of patients and compiles statistics for use in reports and surveys. Keeps daily statistical record information on admissions, deaths, births, and types of treatment rendered.

23. Medical Records Technician

Under the direction of the Medical Record Librarian is responsible for departmental organization and management of the medical records, codes diseases and operations,

prepares statistics, assists physician in research. May assume independent duties in small institutions.

24. Medical Stenographer
    Takes shorthand dictation of correspondence, reports and meetings. Transcribes dictated material using typewriter with knowledge of, and familiarity with, the use and meanings of medical terms and is able to perform stenographic skills and related clerical tasks.

25. Mental Health Worker
    Under professional supervision, is directly involved with the total treatment plan of the mentally ill and emotionally disturbed patient. Is prepared to recognize symptoms of mental disabilities and has treatment concepts of assigned patients. Possesses skills related to basic interviewing, information gathering, counseling, report writing and analysis.

26. Mental Retardation Technician
    Attends to the physical needs and well-being of mentally retarded patients. Aids in the educational and recreational processes under the supervision of professional staff.

27. Nuclear Medicine Technician
    Performs tests using radioactive materials which help physicians diagnose and treat disease. Assists Radiologist and Technologist in operation of sophisticated nuclear radiation detection instruments in clinical use of radionuclides.

28. Nurse Aide
    Performs bedside care of patients. Assists professional members of nursing team in tasks which are important for the patient's comfort and well-being.

29. Occupational Therapy Aide
    Assists Occupational Therapist in medically-orientated occupational therapy programs to rehabilitate patients in hospitals and similar institutions. Prepares work materials and supplies and assists in maintenance of tools and equipment.

30. Optic Mechanic
    Grinds eyeglass lenses to prescription specification and assembles lenses in frames. Operates machines, such as generator, polisher, edger and hardner.

31. Optic Technician
    Assists Optical Engineer in designing mechanical portion of precision-optical instruments. Reviews optical specifications to determine types of mounts, lenses, tools, and fixtures required for construction of optical system.

Assembles optical and mechanical elements to construct instruments.

32. Orderly
Works under direction of professional nurses to perform simple tasks that are important for the patient's comfort and well-being. Generally performs these services for male patients and assumes the heavier work in the nursing unit.

33. Patient Benefit Analyst
Taking into consideration the multi-roles a patient may assume in society, investigates the private, state and/or federal benefits due the patient. Must be knowledgeable of past and current legislature that regulates reimbursement in a wide variety of circumstances. Develops benefit program, according to needs and transmits this information to person or institution rendering service.

34. Pharmacy Helper
Under the supervision of a Pharmacist, stores incoming drugs and chemicals. Prepackages floor stock items and out-patient drugs. Assists in the manufacture of bulk preparations. Maintains orderly and clean work area. Picks up chart orders and delivers medications. Obtains properly labeled drugs for the pharmacist and wraps prescriptions for mailing to outpatients.

35. Physical Therapy Aide
Under supervision of Physical Therapist. Assist those suffering from from disabilities to regain physical function through the use of massage, therapeutic exercise and physical agent, such as heat, cold, water, and electricity. Keeps work area clean.

36. Practical Nursing LPN (Vocational)
Licensed to give nursing care under the supervision of the registered nurse or physician. In complex, specialized nursing situations may function as assistant to the registered professional nurse.

37. Professional Nurse RN (Bachelor's degree or higher)
A term applied to persons meeting the educational, legal and training requirements to practice as professional nurse, as required by the State Board of Nursing. Performs acts requiring substantial specialized judgment and skill in observation, care and counsel of ill, injured, or infirm persons and in promotion of health and prevention of illness.

38. Psychiatric Technician
Maintains day by day contact with mental patients in all phases of hospital living, participates with other members of therapeutic team in observing behavioral changes. Supervises hygenic care. Reports observations and assists

professionals in activities and treatments to modify behavior and promote group living.

39. Public Health Nurse
Supervises and coordinates activities of and trains nursing personnel in government or private health agency. Serves as liaison between staff and administrative personnel, appraises nursing service efficiency, and provides teaching and guidance to improve service. Recommends appointment and assignment of nursing personnel. Maintains and interprets nursing standards to staff advisiory boards, nursing committees, and community groups.

40. Radiation Therapy Technician
Uses radiation producing devices to administer therapeutic treatments as prescribed by a radiologist.

41. Radiologic Technician
Makes X-ray exposures, aids radiologist in fluorscopy. Adjust controls and positions patients for therapy, develop X-rays, keep records, make reports, assume responsibility for X-ray equipment and supplies.

42. Surgical Technician
Assists surgical team in the operating suite in pre-operative tasks and surgical procedures. Understands and functions under strict aseptic techniques. Cleans operating rooms. Cleans and sterilizes used equipment and supplies.

43. Technical Nurse RN (Associates degree and diploma)
Is a registered nurse, capable of planning, supervising and giving direct care to patients. As a general duty nurse, may administer medications and treatments. Assist physician during treatment and examination of patients.

44. Ward Clerk
Works in a ward or floor nursing unit acting as a receptionist and doing much of the paper work. Under supervising nurse direction, may chart medical data on patient's chart and issue requistions for lab, X-ray and dietary or pharmacy services.

## Appendix D -- Occupational Projections

The returned forms were edited for consistency of reporting and tabulated on a CDC 6400 computer (after data cards were keypunched and verified) in cross tabulations and bi-variate distributions of: by occupation for all industries, all occupations by industry, by industry and by occupation, by occupation by each industry, geographic distribution of occupations by county and rank employer preference in their practice of hiring employees.

In projecting the results and estimating State totals it was necessary to utilize the data stored at the University of Michigan, under the Labor Market Information System which is the data bank in which the Colorado Division of Employment has their covered employment stored.

By utilizing the retrieval system set-up in Employment's Research and Analysis Section, which is linked to the Labor Market Information System, we were able to obtain complete totals of those employed in each S.I.C. category used in the study (Variable $E_{pI}$ below). At this time, each industry in its entirety was broken down into size categories in order to insure that the sample was representative according to size in relation to the rest of the industry.

Since the characteristics of employers (and their employees) were essentially the same on each mailing, it was concluded that the characteristics of those who tended to answer quickly (or at all) were essentially the same as those who did not. Therefore, the sample proportions are unbiased estimators of the population proportions so that the population proportions can be estimated by applying a simple ratio to the sample proportions.

The following is a more technical explanation of the development of our statistics:

E means the number of employees

M means the number of medical employees

The first subscript indicates whether the variable refers to the sample (S) or the population (P).

The second subscript indicates that the variable applies to industry groups (I), and occupation (O), or if left blank, is a total of all occcupations (or industries). Thus:

$$EM_{PI} = EM_{PO} = M_P,$$

by definition. This says that in the population, the total of all medical employees $M_P$ equals the sum of all medical employees if added by occupation $EM_{PO}$, which equals the sum of all medical employees if added by industry $EM_{PI}$.

To start with, we want to publish each $M_{PO}$, medical employees in the population for a specific occupation. We have $E_{PI}$, $E_{SI}$, and $M_{SI}$. (We also have $M_{SO}$ but we will not use it yet.) It was assumed that

$$\frac{E_{PI}}{E_{SI}} = \frac{M_{PI}}{M_{SI}}$$

Since our sample was not biased, this yields $M_{SI} = \frac{E_{PI}\, M_{SI}}{E_{SI}}$

This formula was applied to each industry group yielding figures for medical employees in the population for each industry. These were totaled to give total of medical employers in the population:

$$EM_{PI} = M_P$$

The number of medical employees in the sample for each industry were totaled to give total medical employees in the sample:

Now it was assumed that

$$\frac{M_P}{M_S} = \frac{M_{PO}}{M_{SO}}$$

Which yields

$$M_{PO} = \frac{M_P}{M_S} \cdot M_{SO}$$

As indicated by the formula, the MP/MS ratio was applied to each $M_{SO}$ (Number of medical employees in the sample for each occupation) was also used to obtain universe figures.

Data for $E_{PI}$ was taken from ES-202, but was supplemented for "hospitals" and "health and allied industries not elsewhere classified."

Exceptions were made to the above procedure for two occupational classifications. Details of this procedure are listed below.

The occupations of Dental Hygienist and Dental Assistant presented us with an unusual situation because our universe was selected from the Employment 202 file which lists all employers who have paid Unemployment Insurance. Many smaller health operations were not included in the universe for this study. Consequently, many of the Dental Offices in the State were not directly contacted. In the industry of Dental Institutions it was determined that our sample, which was representative, consisted of one-sixth of the entire universe. Thus, to project our data and make it truly representative, all the statistics for Dental Hygienist and Dental Assistant were miltiplied by a factor factor of six.

All other occupational statistics in the study were projected in the manner previously explained.

## Selected Industry Codes

Following is a list of industries included in the survey broken down by *three-digit code as defined in the Standard Industrial Classification Manual:

MANUFACTURING

369 - Miscellaneous Electrical Machinery, Equipment and Supplies
3693 - Radiographic X-ray, Fluoroscopic X-ray, Therapeutic X-ray, and other X-ray apparatus and tubes, Electromedical and Electrotherapeutic apparatus

WHOLESALE AND RETAIL TRADE

5086 - Professional Equipment and Supplies
Establishments primarliy engaged in the wholesale distribution of mechanical devices and other equipment used by architects, dentists, engineers, physicians, surgeons, veterinarians, optometrists, osteopaths, and other professional groups.

FINANCE, INSURANCE AND REAL ESTATE

632 - Accident and Health Insurance
6324 - Hospital and Medical Service Plans
Organizations which provide hospital, medical and other health services to subscribers or members in return for the most part through
tals and physicians. Establishments providing these services through their own facilities or employed physicians are classified in Industry 8099.

SERVICES

801 - Offices of Physicians and Surgeons
8011 - Offices of Physicians and Surgeons
Establishments of licensed practitioners having the degree of M.D. and engaged in the practice of general or specialized medicine and surgery. Establishments such as group clinics, in which a group of physicians are associated for the purpose of carrying on their profession, are included in this industry.

802 - Offices of Dentists and Dental Surgeons
8021 - Offices of Dentists and Dental Surgeons

Establishments of licensed practitioners engaged in the practice of general or specialized dentistry.

803 - Offices of Osteopathic Physicians
8031 - Offices of Osteopathic Physicians
Establishments of licensed practitioners engaged in the practice of general or specialized osteopathy.

804 - Offices of Chiropractors
8041 - Offices of Chiropractors
Establishments of licensed practitioners engaged in the practice of chiropraxis.

806 - Hospitals
8061 - Hospitals
Establishments primarily engaged in providing hospital facilities, and clinics and dispensaries. Institutions such as sanatoria, rest homes, convalescent homes and curative baths or spas in which medical or surgical services are not a main function of the institution are classified in Industry 8092.

807 - Medical and Dental Laboratories
8071 - Medical Laboratories
Medical laboratories providing professional analysis, diagnosis, or treatment services to the medical profession, or to the patient on prescription of the physician.

8072 - Dental Laboratories
Establishments primarily engaged in making dentures and artificial teeth to order for the dental profession. The manuafacture of artificial teeth other than to order is classified in Industry 3843.

809 - Health and Allied Services, Not Elsewhere Classified
8092 - Sanatoria, and Convalescent and Rest Homes
Institutions such as sanatoria, convalescent homes, and rest homes, in which medical or surgical services are not a main function of the institution.

8099 - Health and Allied Services, Not Elsewhere Classified
Establishments engaged in rendering health and allied services, not elsewhere classified. Establishments of registered nurses engaged in the independent practice of their profession are included here, but nurses' registries are classified in Industry 7361. Associations or groups formed primarily to provide medical or other health services to their members, in which themselves provide these facilities, are included in

this industry. Establishments such as Blue Cross and Blue Shield plans, whose members are supplied these services by independent pnysicians or hospitals under contract are classified in Industry 6324.